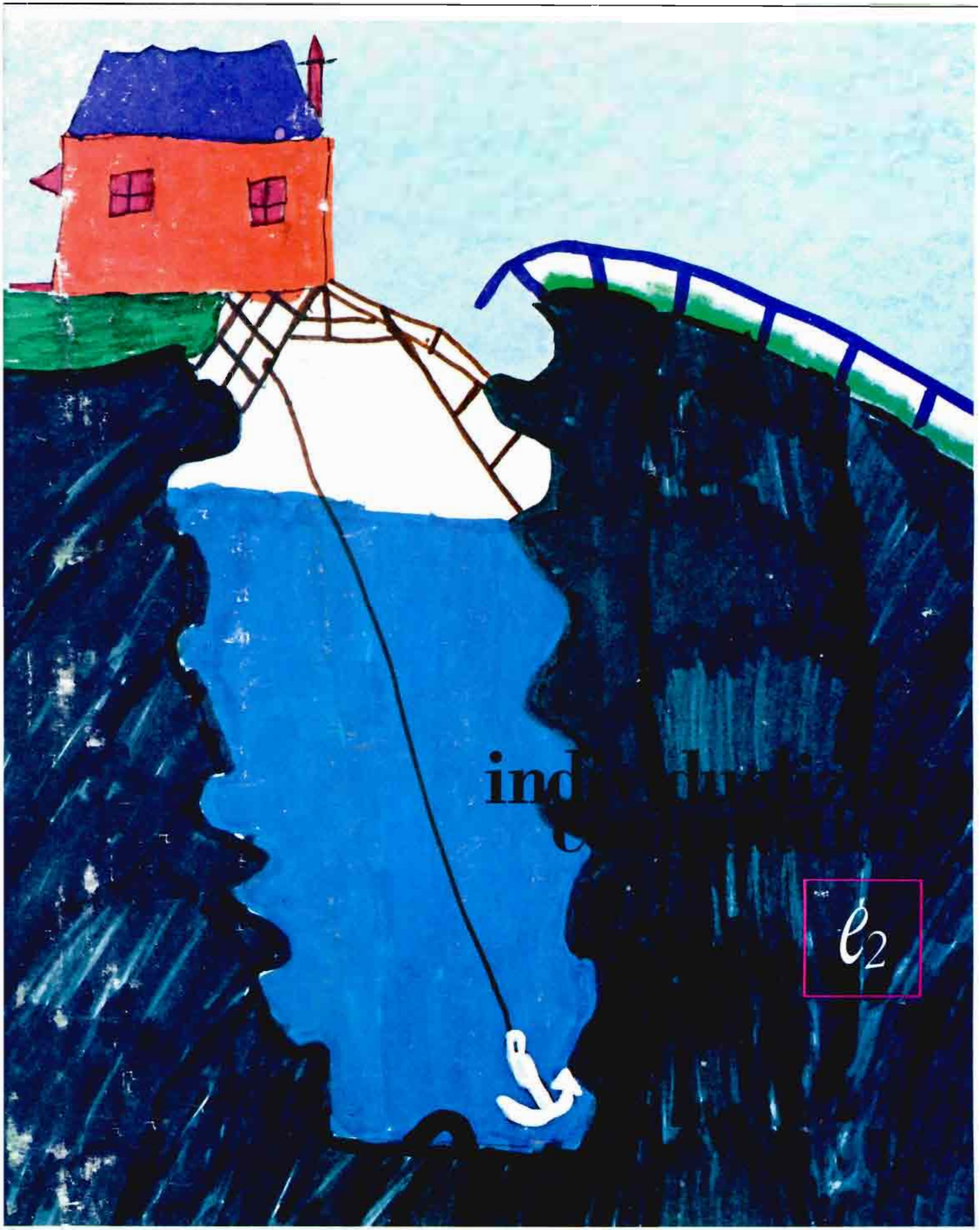
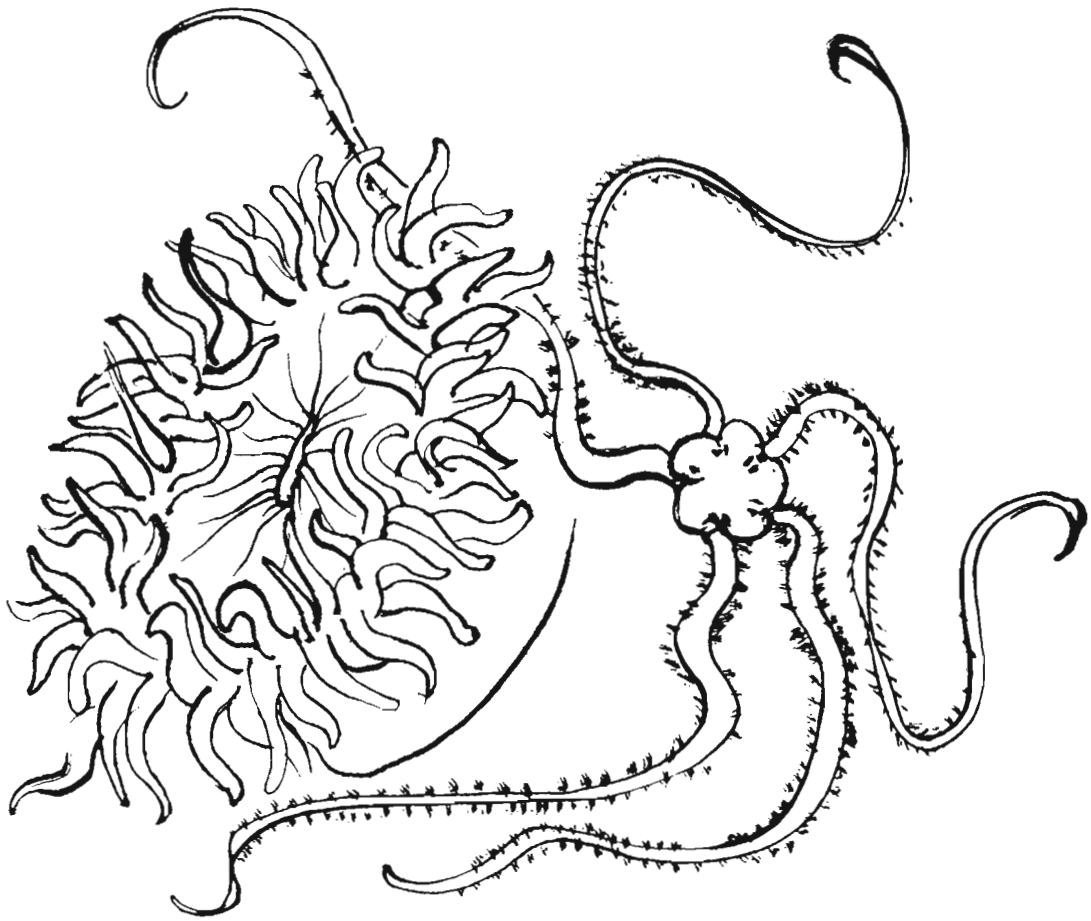


CD math
A ROBERT W. WIRTZ



Cover Art
The Art Class of Gordon Parker at Carmelo Summer School

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If the results are not surprising,
then one of us goofed·····signed "GOOOOFY."

78 78 + 78 A.	74 74 + 74 B.	197 85 + 60 C.	198 76 + 50 D.	137 148 +159 E.	42 6 78 + 9 F.

14 25 36 7 + 8 G.	37 x 21 H.	74 x 12 I.	27 x 37 A.	2500 1597 1597 1597 + 1597 B.

Peculiar Pairs

46 x 32 C. 64 x 23 F.	86 x 34 D. 68 x 43 G.	253 x 64 E. 352 x 46 D.	52 63 + 74 B. 74 53 + 62 H.	48 x 6 D. 32 x 9 H.

	A.	B.	C.	D.
E.	444	8888	111	16192
F.	337	222	1472	135
G.	999	90	342	2924
H.	234	189	777	288
I.	1234	888	555	324

Pairs of Single-Digit Whole Number Factors

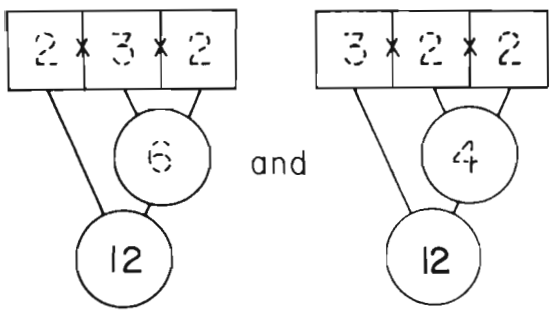
Rule: if not alike, please write the larger factor above the smaller factor.

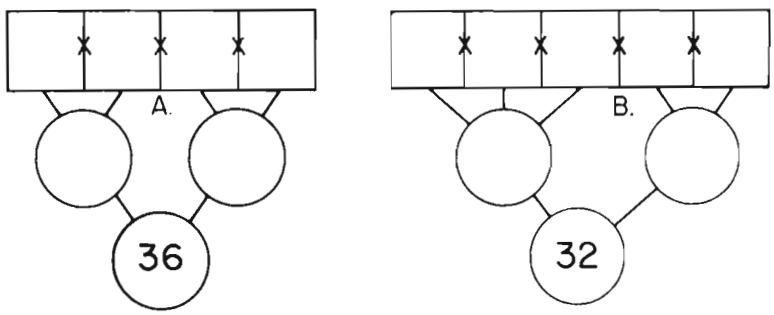
3 x 2 = 6	x 2 = 8 (A.)	x 3 = 9 (B.)	x = 10 (C.)	x 2 = 12 (D.)	x 3 = 12 (E.)	x = 14 (F.)	x = 15 (A.)	x 2 = 16 (B.)	x 4 = 16 (C.)
x 2 = 18 (D.)	x 3 = 18 (E.)	x = 20 (F.)	x = 21	x 3 = 24	x 4 = 24 (C.)	x = 25	x = 27	x = 28	x = 30 (E.)
x = 32	x 4 = 36	x 6 = 36	x = 40	x = 42 (E.)	x = 45	x = 48 (C.)	x = 49 (D.)	x = 54	x = 56 (F.)

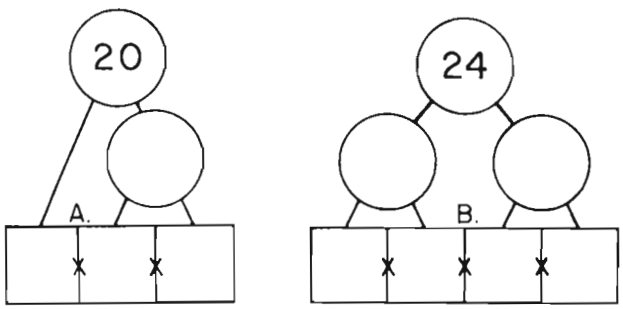
Taming frightfully big numbers . . .

1 x 1 = 1	3 x 5 = 15	6 x 5 = 30
10 x 1 = 10	30 x 5 = A.	60 x 5 = E.
1 x 10 = 10	3 x 50 = K.	6 x 50 = K.
10 x 10 = B.	3 x 500 = D.	6 x 500 = F.
100 x 10 = C.	300 x 5 = I.	600 x 5 = G.
10 x 100 = J.	30 x 50 = D.	60 x 50 = F.

Factor Trees (excluding 1 as a factor)

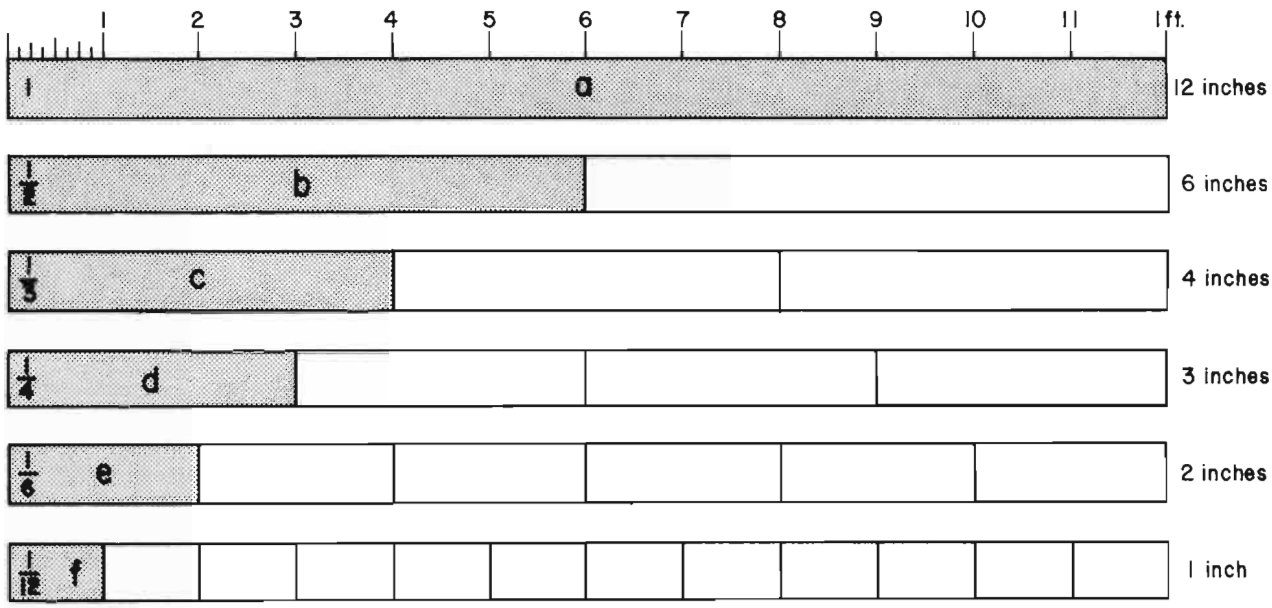






	A.	B.	C.	D.	E.	F.
G.	2,2,3,3	2,8	6,8	2,7	3,4	3,000
H.	3,5	2,2,2,2,2	2,5	2,9	5,6	4,5
I.	2,4	2,2,2,3	4,4	1500	3,6	2,7
J.	2,2,5	3,3	1000	2,6	6,7	7,8
K.	150	100	4,6	7,7	300	5,6

What Can You See? . . . (suggested by a 1 foot ruler)



b + b = C

$\frac{1}{2} + \frac{1}{2} = 1$

f + f = ☐

$\frac{1}{12} + \square = \square$ A. B.

d − e = ☐

☐ − ☐ = ☐ C. G. F.

b − c = ☐

☐ − ☐ = ☐ D. A. B.

2e + 2f = b

$\frac{2}{6} + \frac{2}{12} = \frac{1}{2}$

3f − e = ☐

$\frac{3}{12} - \square = \square$ B. A.

a − c = 2C

$1 - \frac{1}{3} = \frac{2}{3}$

a − d = ☐

☐ − ☐ = ☐ B. C. D.

2c − 3f = ☐

☐ − ☐ = ☐ C. A. B.

d × 2 = ☐

☐ × 2 = ☐ C. D.

f × 3 = ☐

☐ × 3 = ☐ A. E.

b ÷ 2 = ☐

☐ ÷ 2 = ☐ D. E.

b ÷ 3 = ☐

☐ ÷ 3 = ☐ F. G.

	A.	B.	C.	D.
E.	$\frac{1}{3}$	$\frac{5}{12}$	$\frac{1}{4}$	$\frac{1}{5}$
F.	$\frac{1}{12}$	1	$\frac{2}{3}$	$\frac{1}{2}$
G.	$\frac{3}{12}$	$\frac{1}{6}$	$\frac{3}{8}$	$\frac{3}{4}$

From Easier → to more Difficult

From Easier ↓ to more Difficult

100%	50%	25%	10%	5%	3%	$1\frac{1}{2}$%
300	A.	B.	C.	D.	E.	A.
100	B.	C.	A.	E.		A.
400	C.					E.
200	D.			C.	E.	E.

100%	50%	25%	75%	150%	15%	$7\frac{1}{2}$%
600	D.	A.	C.			B.
200	D.	B.	A.	D.	C.	D.
800		C.		D.		E.
1000			B.		A.	B.

2 (x4) (x3)

24 (÷4) (÷3)

8 (÷2) (x5)

8 (x) 40 (÷) 20

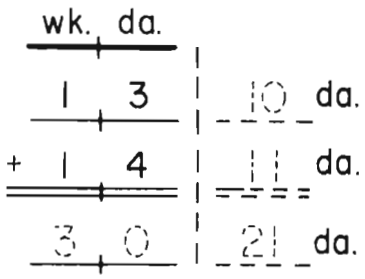
26 (+9) (-7)

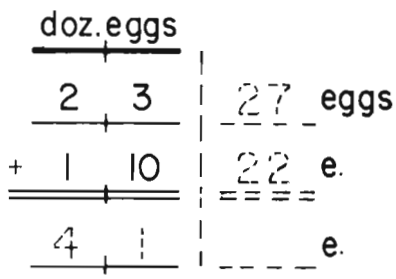
26 (-) 19 (+) 28

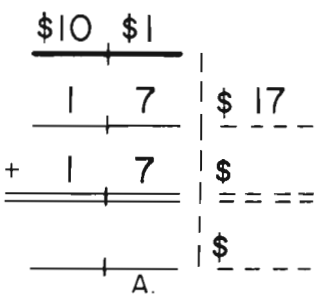
	A.	B.	C.	D.	E.
F.	5	50	450	15	3
G.	150	750	200	1200	60
H.	$4\frac{1}{2}$	45	30	300	9
I.	$1\frac{1}{2}$	75	10	100	6

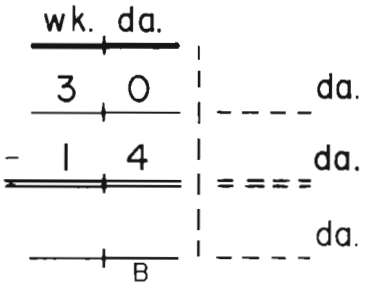
+, −, ×, ÷ Measurements: 7 days = 1 week

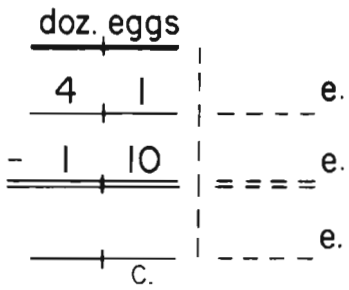
12 eggs = 1 dozen

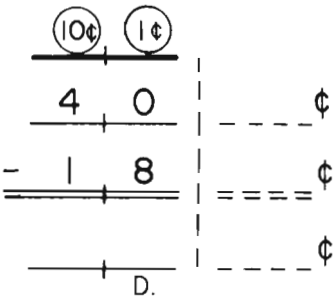




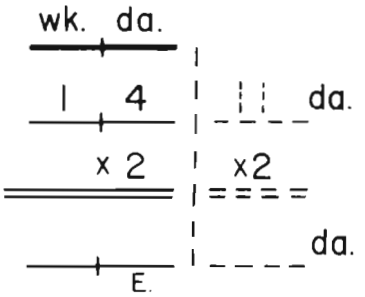


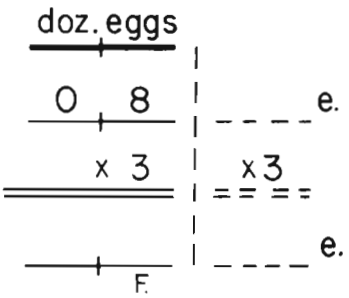


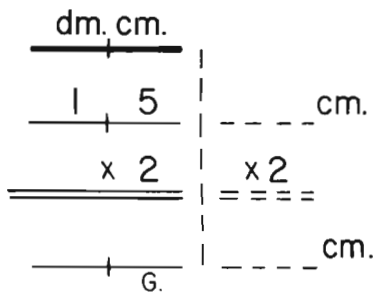


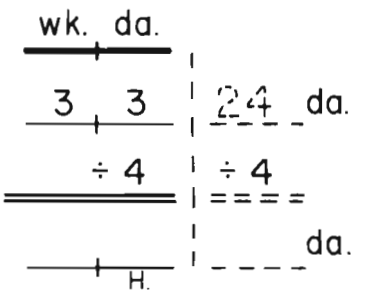


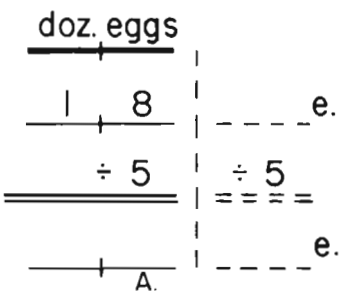
1 decimeter = 10 centimeters

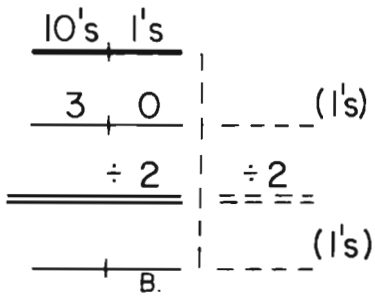


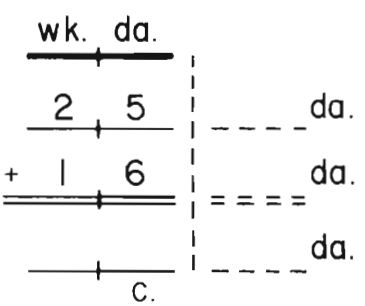


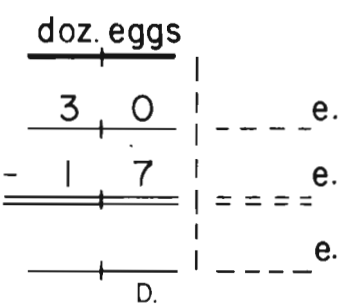












	A.	B.	C.	D.	E.
F.	1,1	2,0	2,3	3,3	4,4
G.	3,4	1,5	3,0	1,5	3,1
H.	0,4	1,3	4,4	2,2	0,6

Estimation

. . . or "coming close" . . . with easier arithmetic.

9 x 7 =

					How close?
+1	+0	→	10 x 7	= 70	(+7)
		→	8 x 8	= ____A.	(+1) x
		→	10 x ____	= ____B.	(−3)

x "closest"

Getting an exact result

$$\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$$

8 x 13 =

+3	−3	→	11 x 10	= ____C.	(+6)
+2	−3	→	____ x 10	= 100	( ) x A.
+2	−2	→	10 x ____	= 110	( )

$$\begin{array}{r} 13 \\ \times 8 \\ \hline \end{array}$$

12 x 23 =

+3	−3	→	15 x ____	= ____D.	( ) C.
−1	+2	→	____ x 25	= ____	( ) x
−2	+4	→	____ x ____	= ____A.	( ) D.

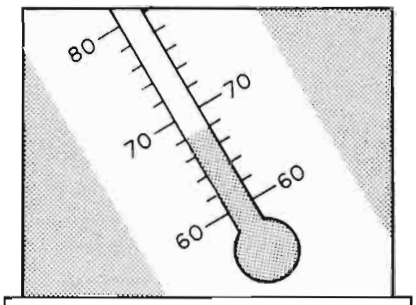
$$\begin{array}{r} 23 \\ \times 12 \\ \hline \end{array}$$

7 x 11 =

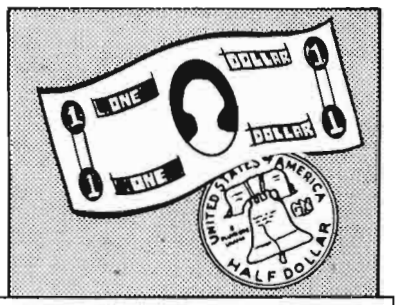
+1	−2	→	8 x ____	= ____B.	( )
+1	−1	→	____ x 10	= ____C.	( )
+2	−2	→	____ x ____	= ____D.	( )
−2	+3	→	____ x ____	= ____A.	( ) B.
−1	+2	→	____ x ____	= ____	( ) x C.
−3	+8	→	____ x ____	= ____	( ) x D.

$$\begin{array}{r} 11 \\ \times 7 \\ \hline \end{array}$$

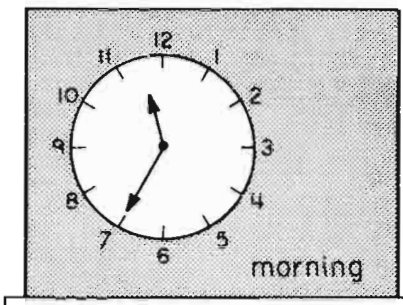
	A.	B.	C.	D.
E.	70	72	111	−6
F.	64	−7	80	−1
G.	−4	60	+1	81
H.	270	70	+24	300



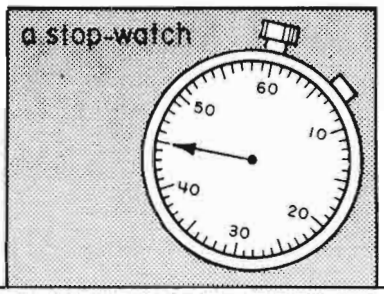
temperature shown
° A.
17° higher
° B.
39° lower
° C.



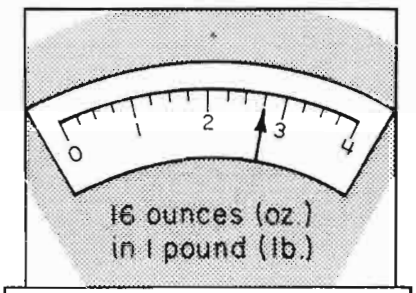
amount shown
$. D.
3 times as much
$. E.
one third as much
$.



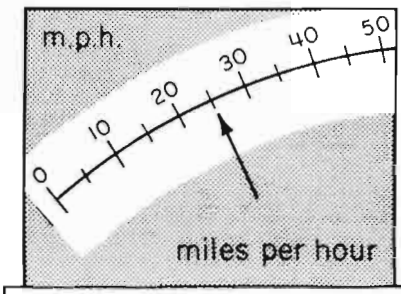
time shown
: a.m. G.
1½ hours later
: H.
1¼ hours earlier
: I.



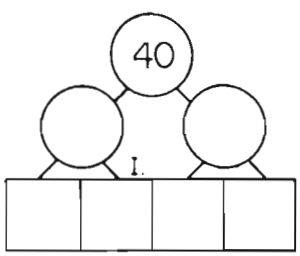
time shown (less than 1 minute)
( ) min., ___ sec. A.
twice as long
___ min., ___ sec. B.
one third as long
___ min., ___ sec. C.
½ minute longer
___ min., ___ sec.

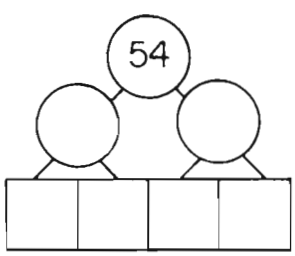


amount shown
___ lb., ___ oz. E.
half as much
___ lb., ___ oz. F.
7 ounces more
___ lb., ___ oz. G.
14 ounces less
___ lb., ___ oz. H.



speed shown
___ m.p.h. A.
17 m.p.h. faster
___ m.p.h. E.
twice as fast
___ m.p.h.
half as fast
___ m.p.h. I.

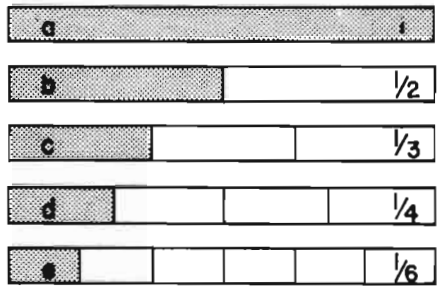




	A.	B.	C.	D.	E.
F.	25	1,30	1,6	1.50	2,12
G.	68	11:35	0,15	3,3	42
H.	0,45	85	1:05	1,14	4.50
I.	2,2 2,5	2,3 3,3	29	10:20	12½

On Your Own (I)

$$\begin{array}{r} 37 \\ 37 \\ 37 \\ +\ 37 \\ \hline \end{array} \qquad \begin{array}{r} 100 \\ -\ 37 \\ \hline \end{array} \qquad \begin{array}{r} 37 \\ \times\ 12 \\ \hline \end{array} \qquad \begin{array}{r} 23 \\ \times\ 46 \\ \hline \end{array}$$



Please circle the letter after the line you think will be the best "estimate."

12 x 12	
10 x 10	A.
10 x 15	B.
10 x 20	C.

15 x 15	
10 x 10	D.
10 x 20	E.
20 x 20	F.

$$\begin{array}{rcl} a - 3d & = & \_\_\_\_ \\ \vdots\ -\ \frac{3}{4} & = & \end{array}$$

$$\begin{array}{rcl} b + d & = & \_\_\_\_ \\ + & = & \end{array}$$

$$\begin{array}{rcl} 2c - e & = & \_\_\_\_ \\ - & = & \end{array}$$

2 x 5 = _____

10 x 5 = _____

5 x 20 = _____

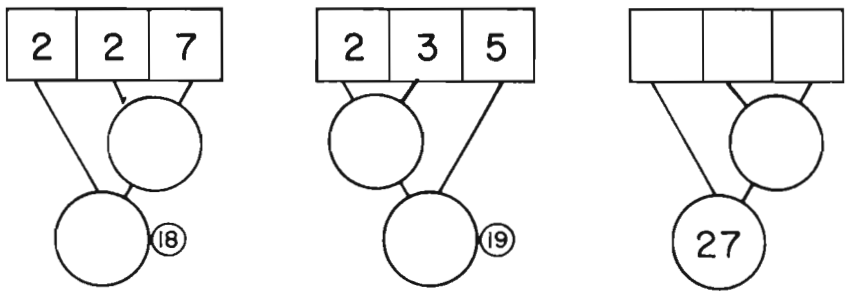
10 x 20 = _____

10 x 50 = _____

20 x 50 = _____

2 x500 = _____

10 x500 = _____



100 %	50 %	25 %	10 %	5 %
60	30			
100		25		
50			5	

1 doz. = 12 eggs

doz.	eggs	
2	4	_____ e.
+ 1	11	_____ e.
		= = = = =
		_____ e.

doz.	eggs	
3	3	_____ e.
− 1	10	_____ e.
		= = = = =
		_____ e.

How do you feel?

If the results aren't interesting,
then one of us goofed! . . . . signed "GOOOOOFY"

$4\overline{)1284}$ A.	$7\overline{)1554}$ B.	$6\overline{)342}$ C.	$4\overline{)1776}$ A.
$15\overline{)360}$ B.	$13\overline{)169}$ C.	$12\overline{)408}$ A.	$23\overline{)2553}$ B.
$\begin{array}{r} 2599 \\ 2589 \\ +\ 2589 \\ \hline \end{array}$ C.	$12\overline{)1476}$ A.	$\begin{array}{r} 874 \\ 874 \\ 474 \\ 474 \\ 874 \\ +\ 874 \\ \hline \end{array}$ B.	$12\overline{)4140}$ C.
$\begin{array}{r} 789 \\ 889 \\ 889 \\ +\ 889 \\ \hline \end{array}$ A.	$43\overline{)903}$ B.	$52\overline{)1768}$ C.	

A.	B.	C.
444	21	57
34	222	345
3456	111	13
123	24	34
321	4444	7777

Pairs of Single-Digit Whole Number Factors.

Rule: if not alike, please write the larger factor above the smaller factor.

A.	B.	C.	D.	E.	F.	G.	H.	I.	J.
X	X 2	X	X 2	X 2	X	X 3	X	X 3	X
10	12	14	16	18	15	18	21	24	27

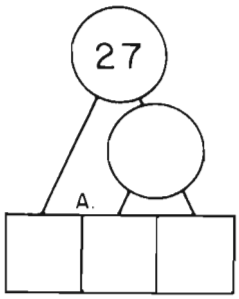
K.									
X	X 4	X	X	X	X	X	X	X	X
20	24	28	32	36	25	30	35	40	45

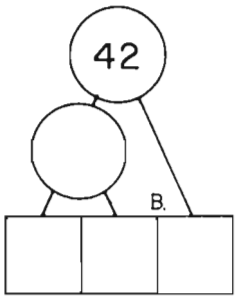
	A.	D.	F.	G.	H.	I.	J.	K.
X 6	X	X	X	X	X	X	X	X
36	42	48	54	49	56	63	64	72	81

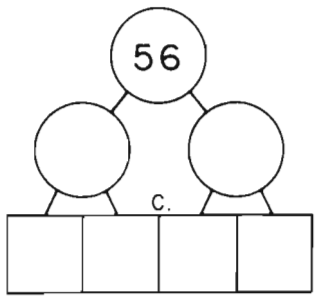
Taming frightfully big numbers . . .

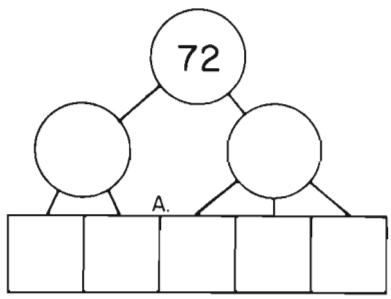
2 × 5 = 10	8 × 9 = 72	2 × 12 = 24
2 × 50 =	8 × 90 = K.	20 × 12 = F.
20 × 5 =	80 × 9 = D.	2 × 120 = I.
2 × 500 =	80 × 90 = E.	20 × 120 = A.
20 × 500 =	8 × 900 = J.	2 × 1200 = G.
200 × 500 = F.	800 × 9 = E.	200 × 12 = A.

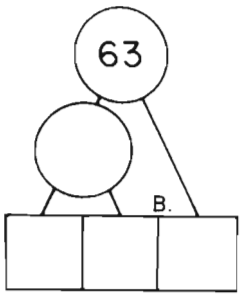
Factor Trees (excluding 1 as a factor)

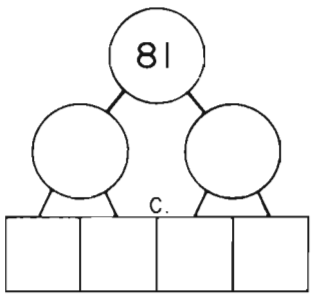






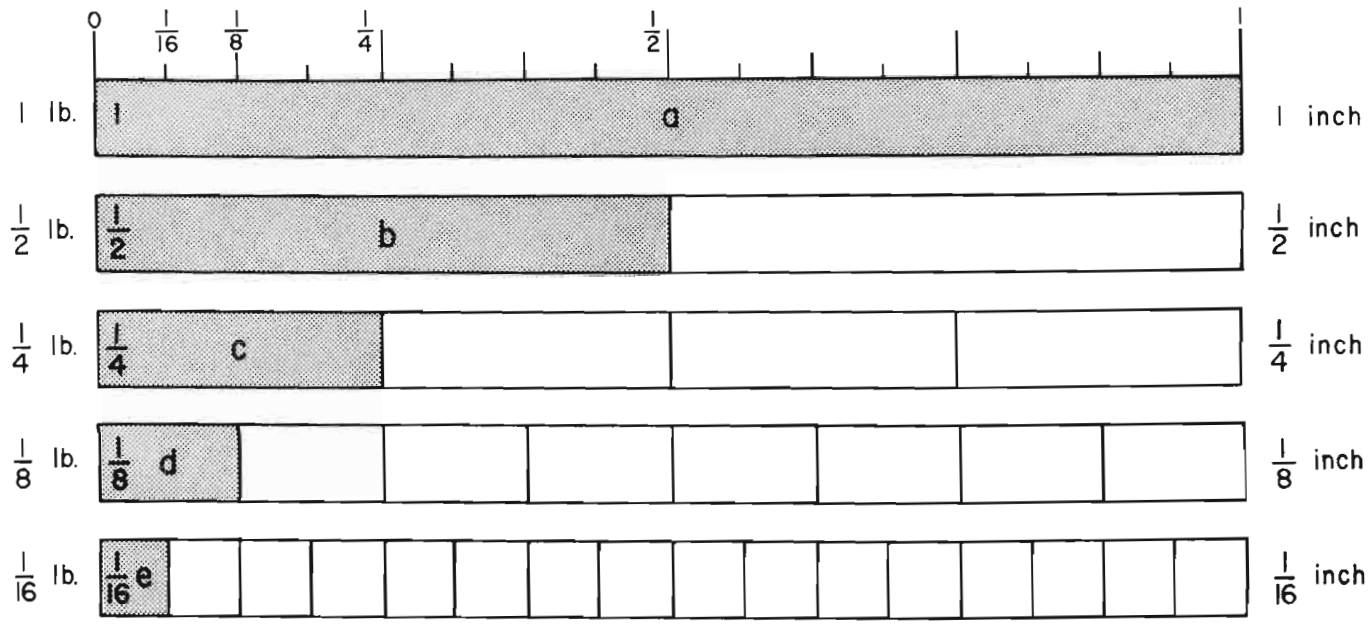






	A.	B	C	D	E.	F.
G.	2400	3,3,7	2,7	3,6	7,8	100,000
H.	3,3,3	2,6	7,9	3,7	2,9	7,7
I.	2,5	8,8	2,2,2,7	6,9	3,8	240
J.	6,8	2,3,7	3,9	2,8	7200	8,9
K.	2,2,2,3,3	9,9	3,3,3,3	720	4,5	3,5

What Can You See? . . . (suggested by a pound of butter or 1 inch)



$$\frac{c + c}{\frac{1}{4} + \frac{1}{4}} = \frac{b}{\frac{1}{2}}$$

$$\frac{b + b}{\frac{1}{2} + \text{A.}} = \frac{\quad}{1}$$

$$\frac{a - 3c}{1 - \frac{3}{4}} = \frac{\quad}{\text{C.}}$$

$$\frac{3d + 2e}{\frac{3}{8} + \frac{2}{16}} = \frac{\quad}{\text{A.}}$$

$$\frac{b - c}{\text{E.} \quad - \quad \text{F.}} = \frac{\quad}{\text{C.}}$$

$$\frac{2d - e}{\text{B.} \quad - \quad \text{C.}} = \frac{3e}{\text{A.}}$$

$$\frac{b - d}{\text{A.} \quad - \quad \text{E.}} = \frac{\quad}{\quad}$$

$$\frac{d - e}{\text{A.} \quad - \quad \text{C.}} = \frac{\quad}{\text{E.}}$$

$$\frac{c + 3e}{\text{C.} \quad + \quad \text{A.}} = \frac{\quad}{\quad}$$

$$\frac{3c - b}{\text{D.} \quad - \quad \text{A.}} = \frac{\quad}{\text{C.}}$$

$$\frac{7d - c}{\text{C.} \quad - \quad \text{F.}} = \frac{\quad}{\text{E.}}$$

$$\frac{5d + c}{\text{B.} \quad + \quad \text{C.}} = \frac{\quad}{\quad}$$

$$\frac{c \times 2}{\text{F.} \quad \times 2} = \frac{\quad}{\text{A.}}$$

$$\frac{3e \times 3}{\text{F.} \quad \times 3} = \frac{\quad}{\text{B.}}$$

$$\frac{3c \div 3}{\text{D.} \quad \div 3} = \frac{\quad}{\text{C.}}$$

$$\frac{2c \div 4}{\div 4} = \frac{\quad}{\text{E.}}$$

	A.	B.	C.	D.
E.	$\frac{1}{8}$	$\frac{5}{8}$	$\frac{1}{16}$	$\frac{1}{2}$
F.	$\frac{3}{16}$	$\frac{9}{16}$	$\frac{1}{4}$	$\frac{3}{8}$
G.	$\frac{1}{2}$	$\frac{2}{8}$	$\frac{7}{8}$	$\frac{3}{4}$

From Easier → to more Difficult

From Easier ↓ to more Difficult

100 %	50 %	25 %	75 %	10 %	5 %	$2\frac{1}{2}$ %
$ 10.00	$ 5.00	$ 2.50	$ 7.50	$ 1.00	$ .50	$ .25
$ 50.00	$ 25.00	$ 12.50	$ A.	$ B.	$ C.	$ 1.25
$ 100.00	$ D.	$ A.	$ E.	$ C.	$ B.	$ C.
$ 150.00	$ E.	$ 37.50	$ B.	$	$	$ 3.75

100 %	50%	150%	25 %	125%	200%	250%
$ 100.00	$ 50.00	$150.00	$ A.	$ H.	$ C.	$ D.
$ 25.00	$ 12.50	$ A.	$ B.	$ C.	$ D.	$
$ 75.00	$ A.	$ B.	$	$	$	$ A.
$ 175.00	$	$	$ E.	$	$	$ A.

Short CHAIN REACTIONS

7 (+8) (+5)
F. G.

2 (x3) (x4)

20 (-8) (-5)
I. H.

24 (÷3) (÷4)

7 (+5) (+8)
E. G.

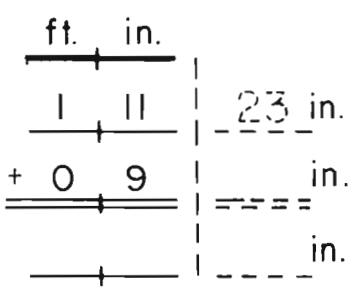
20 (-5) (-8)
F. H.

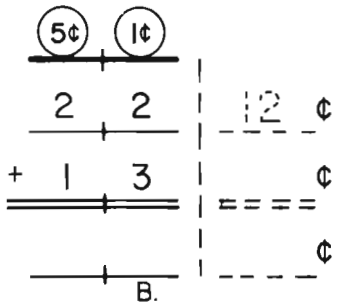
	A.	B.	C.	D.	E.
F.	187.50	6.25	2.50	15	43.75
G.	37.50	20	31.25	250.00	75.00
H.	25.00	5.00	10.00	7	125.00
I.	437.50	112.50	200.00	50.00	12

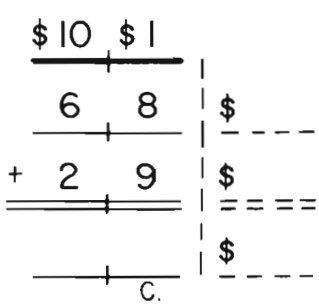
+, −, ×, ÷ Measurements

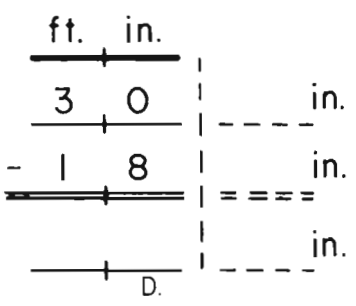
1 foot = 12 inches

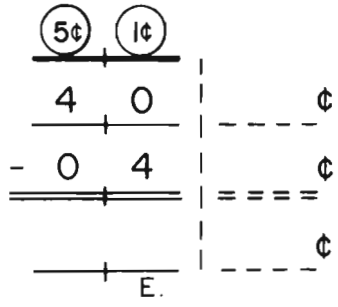
1 nickel = 5 pennies

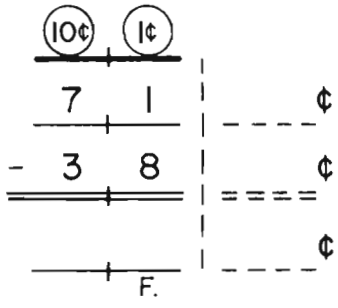




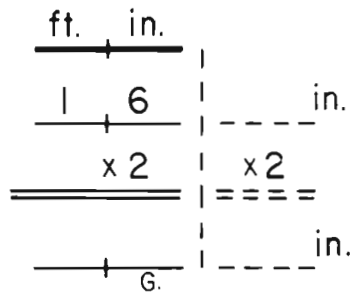


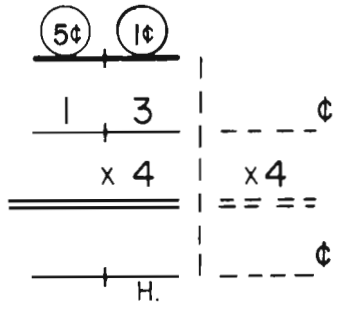


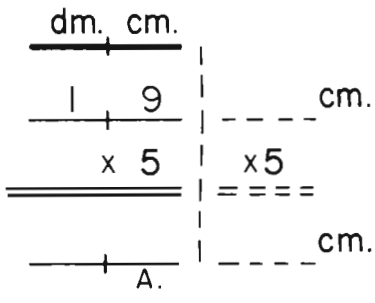


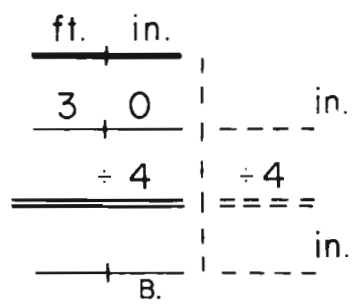


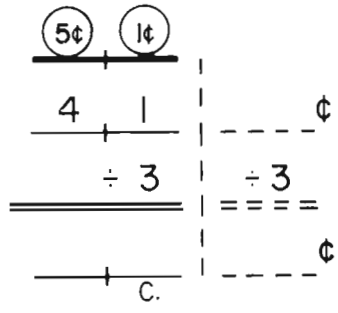
1 decimeter = 10 centimeters

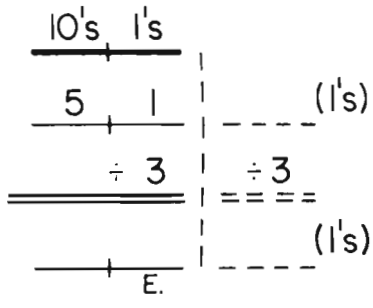


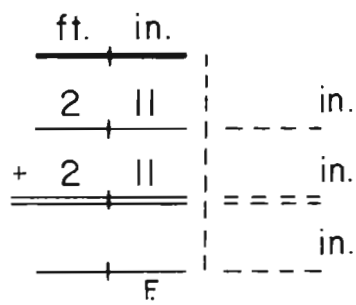


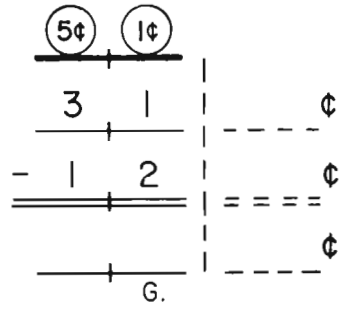












	A.	B.	C.	D.	E.
F.	6,0	0,9	9,7	3,3	5,10
G.	2,10	1,4	3,0	1,4	1,7
H.	9,5	4,0	1,2	6,2	3,1

Estimation . . . or "coming close" . . . with easier arithmetic.

384 ÷ 16 =

				(How close?)
-84	+4	→	÷ =	( )A.
+16	+4	→	÷ =	( )B.
+66	-1	→	÷ =	( )C.

Getting an exact result

$16\overline{)384}$ D.

---

676 ÷ 13 =

-76	- 3	→	600 ÷ 10 =	( )A.
		→	600 ÷ 15 =	( )B.
		→	600 ÷ 12 =	( )C.

$13\overline{)676}$

---

342 ÷ 19 =

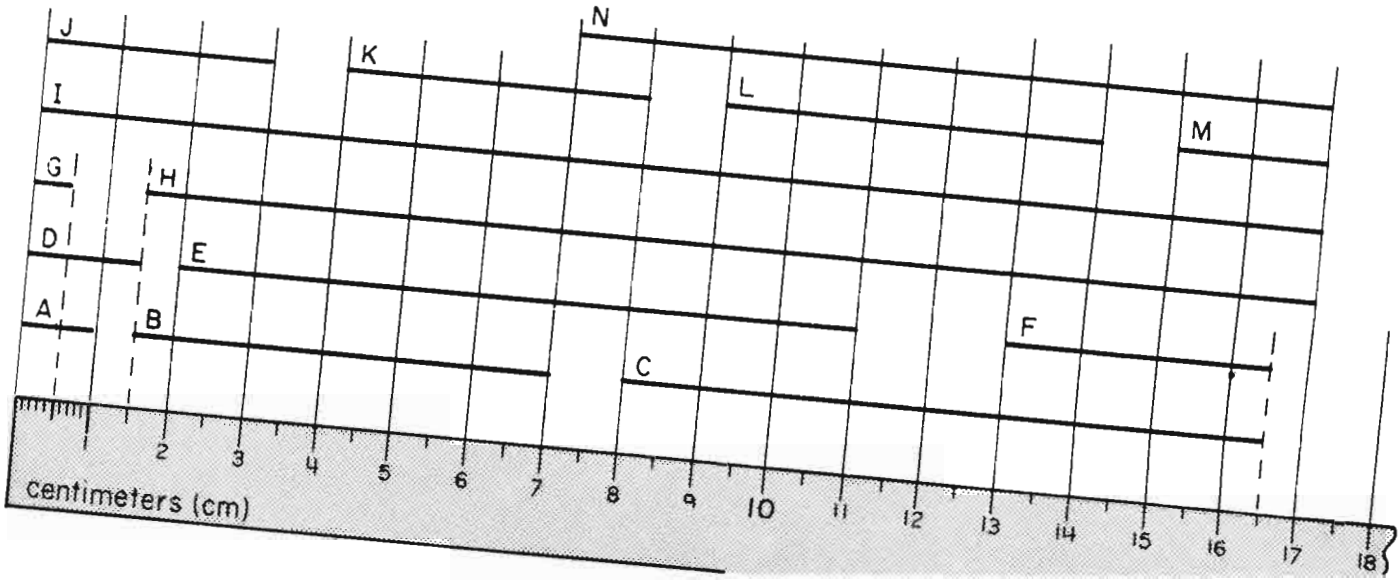
		→	÷ =	( )
		→	÷ =	( )
		→	÷ =	( )

$19\overline{)342}$

Taming frightfully big numbers . . .

1 x 7 = 7	2 x 5 = 10	10 x 80 = F.
10 x 7 = A.	20 x 5 = D.	40 x 50 = B.
7 x 10 = E.	5 x 20 = E.	
10 x 70 = C.	20 x 50 = C.	
70 x 10 = E.	50 x 20 = H.	
700 x 1 = C.	500 x 2 = C.	
1 x 700 = E.	2 x 500 = H.	

	A.	B.	C.	D.
E.	70	-12	700	100
F.	-9	800	-2	24
G.	+7	2,000	+6	18
H.	+8	-4	1000	52



Lengths of lines shown		Sums of lengths	Differences of lengths
A: 1 cm. (A.)	H: _____ cm. (F.)	A and B: _____ cm. (C.)	A and B: 4.5 cm.
B: _____ cm. (C.)	I: _____ cm. (G.)	C and D: _____ cm. (B.)	C and D: _____ cm. (G.)
C: 8.5 cm.	J: _____ cm. (H.)	E and F: _____ cm. (D.)	E and F: _____ cm. (H.)
D: _____ cm. (C.)	K: _____ cm. (I.)	G and H: _____ cm. (E.)	G and N: _____ cm. (I.)
E: _____ cm. (D.)	L: _____ cm. (H.)	I and B: _____ cm. (F.)	H and I: _____ cm. (J.)
F: _____ cm. (E.)	M: _____ cm. (A.)	C and H: _____ cm. (G.)	I and C: _____ cm. (K.)
G: .5 cm.	N: _____ cm. (B.)	G and N: _____ cm. (H.)	D and N: _____ cm. (B.)

Taming frightfully big numbers . . .

10 x 10 = _____ (H.)	1000 ÷ 2 = _____ (A.)
20 x 10 = _____	1000 ÷ 4 = _____
20 x 50 = _____	1000 ÷ 8 = _____ (D.)
200 x 20 = _____ (C.)	1000 ÷ 20 = _____ (B.)
200 x 50 = _____	1000 ÷ 40 = _____
200 x 500 = _____ (A.)	1000 ÷ 80 = _____ (F.)

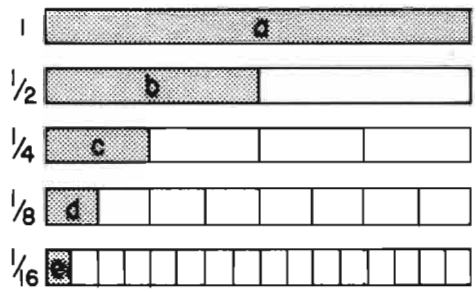
	A.	B.	C.	D.	E.	F.
G.	500	24	17	7	16	15.5
H.	100	5	5.5	3	10.5	11
I.	1	10	4000	9	9.5	4
J.	100,000	50	1.5	125	8	22.5
K.	2	8.5	6.5	12.5	3.5	12½

On Your Own (II)

$$\begin{array}{r} 185 \\ 185 \\ +\ 185 \\ \hline \end{array}$$

$5\overline{)215}$ $23\overline{)1035}$

3 x $1.50 = $ ____



Please circle the letter after the line you think will be the best "estimate."

96 ÷ 23		234 ÷ 18	
90 ÷ 30	A.	240 ÷ 20	D.
100 ÷ 20	B.	300 ÷ 15	E.
100 ÷ 25	C.	200 ÷ 20	F.

$$\begin{array}{r} c + 2d = \_\_\_\_ \\ + \quad = \end{array}$$

$$\begin{array}{r} 3e + 3e = \_\_\_\_ \\ + \quad = \end{array}$$

$$\begin{array}{r} a - 3d = \_\_\_\_ \\ - \quad = \end{array}$$

8 x 10 = ____

80 x 10 = ____

8 x 100 = ____

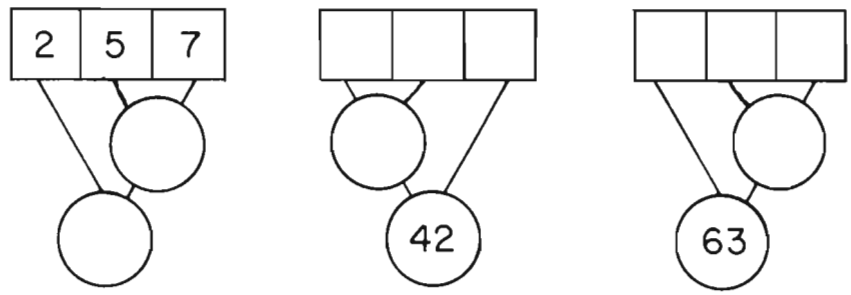
8 x 50 = ____

80 x 50 = ____

5 x 800 = ____

50 x 800 = ____

80 x 500 = ____



100 %	50 %	150 %	25 %	200 %
$ 400	$	$	$	$
$ 300	$	$	$	$
$ 50	$	$	$	$

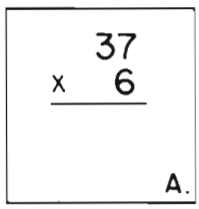
1 week = 7 days

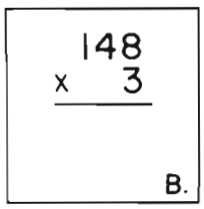
wk.	da.		
1	6		da.
+ 2	4		da.
		= = = =	
			da.

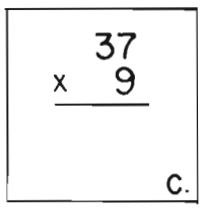
wk.	da.		
3	0		da.
- 1	5		da.
		= = = =	
			da.

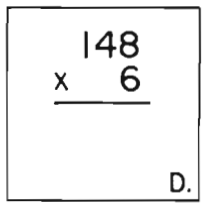
How do you feel?

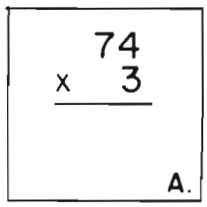
If the results aren't interesting
then one of us goofed! . . . . . signed "GOOOOOFY."

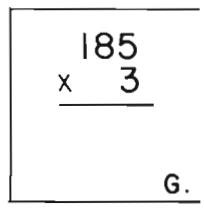


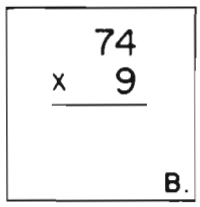


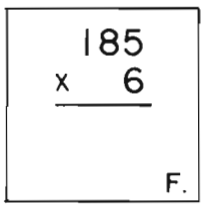


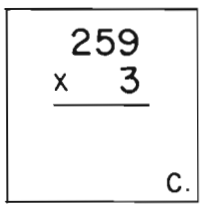


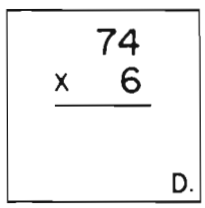


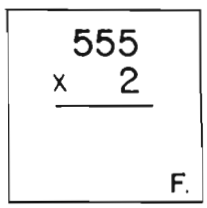


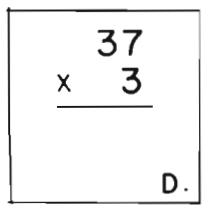


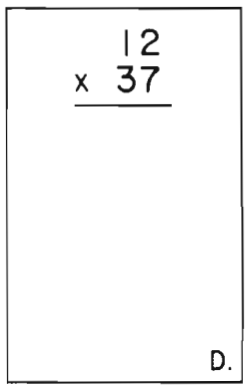


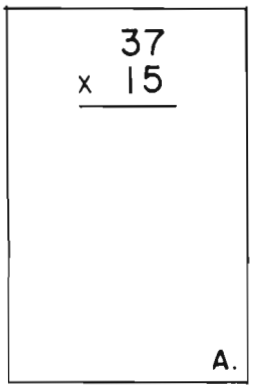


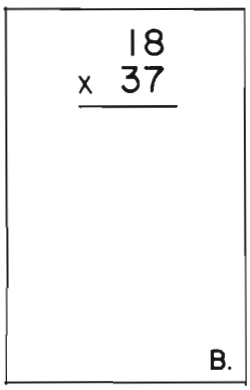


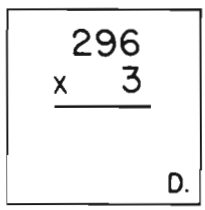


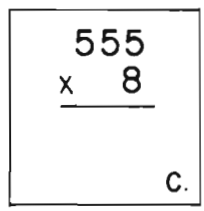


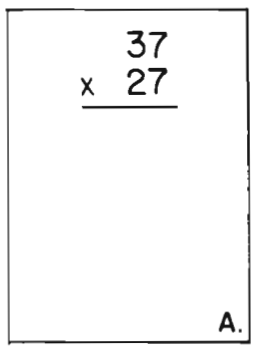


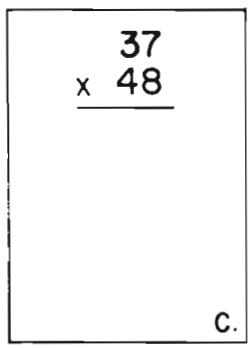


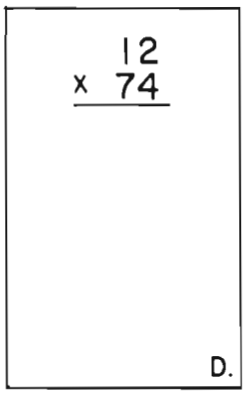


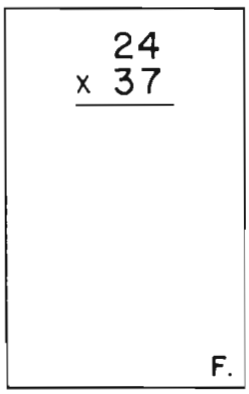


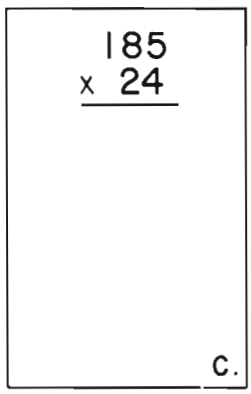


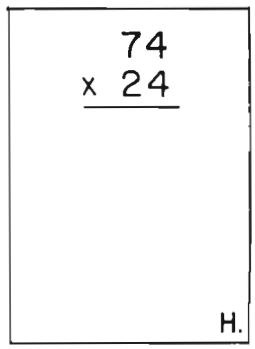


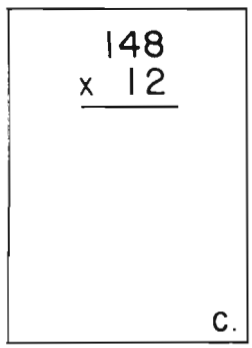


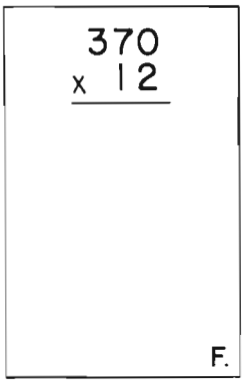


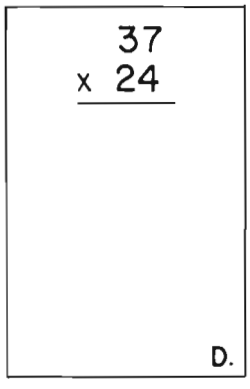


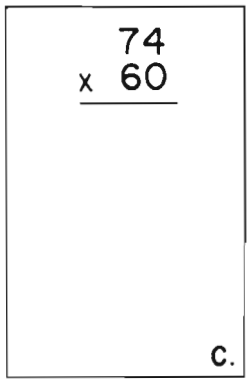






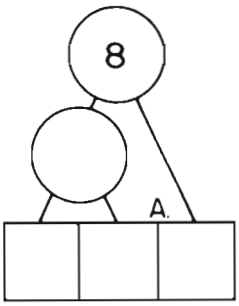


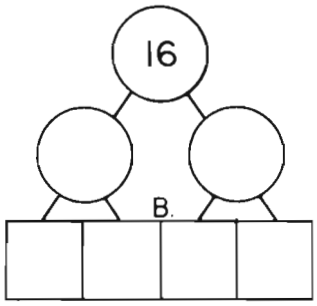


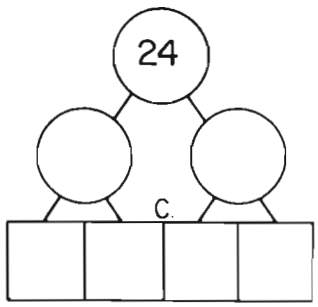


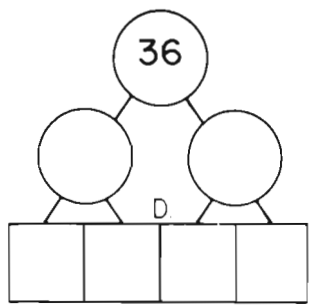
	A.	B.	C.	D.
E.	2220	666	333	111
F.	222	1110	4440	888
G.	555	444	777	444
H.	999	3330	1776	5550

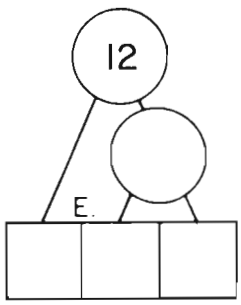
Factor Trees (excluding 1 as a factor)

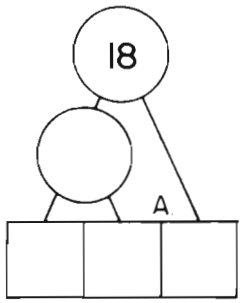


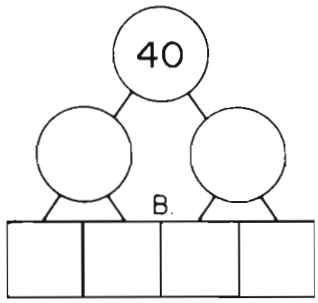


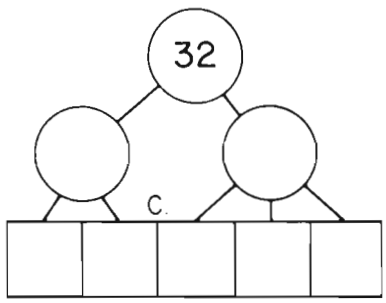


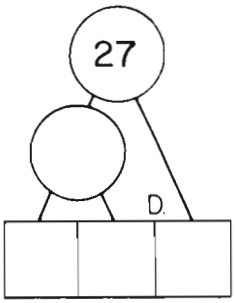


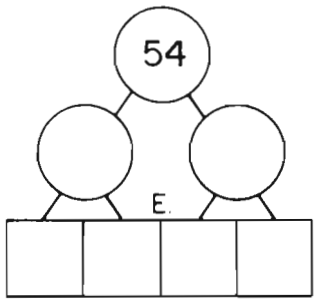


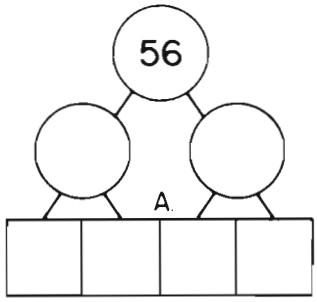


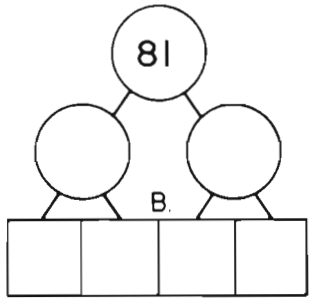


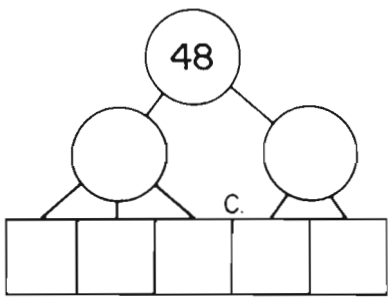


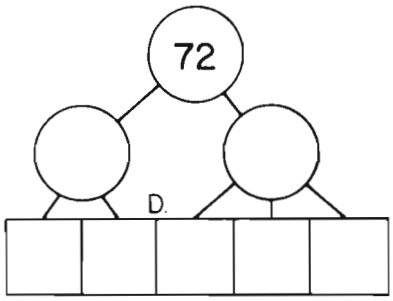


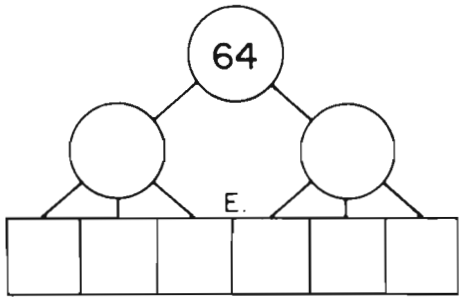


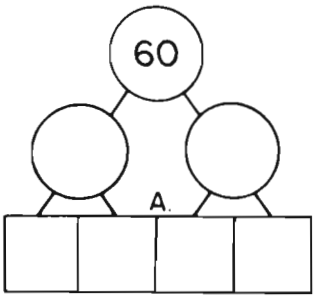


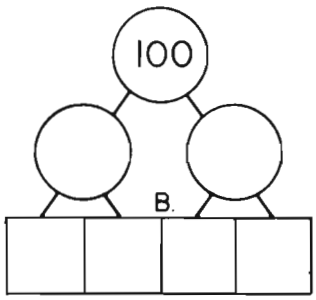






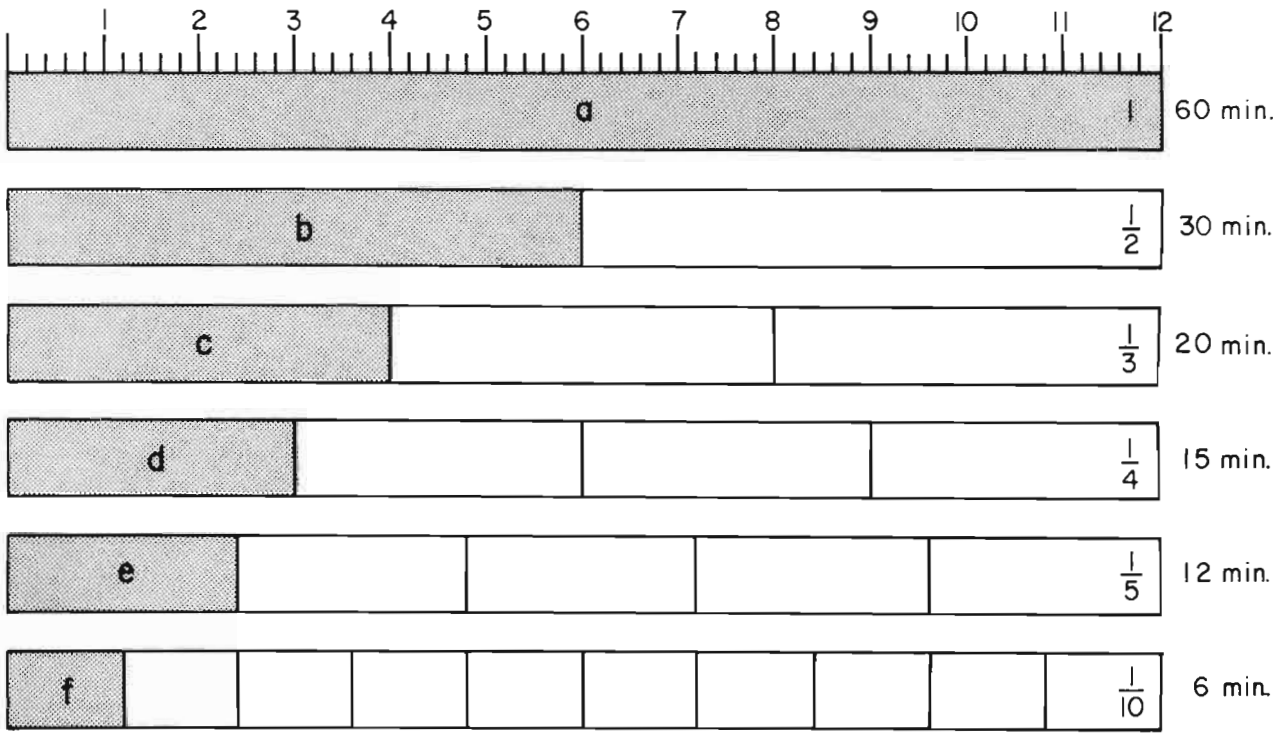






A.	B.	C.	D.	E.
2,2,2,7	2,2,2,5	5,5,5,5	2,2,3,3	7,7,7
2,2,2	3,3,3,3	2,2 2,2,2	3,7,5	2,2,2 2,2,2
2,2,3,5	2,2,5,5	2,2,2,3	2,2,2 3,3	2,2,3
2,3,3	2,2,2,2	2,2 2,2,3	3,3,3	2,3,3,3

What Can You See? . . . (suggested by a clock)



$\frac{e - f}{\frac{1}{5} - \frac{1}{10}} = \frac{f}{\frac{1}{10}}$

$\frac{a - 2c}{1 - \frac{2}{3}} = \underline{\quad}$ A.

$\frac{b + d}{+} = \underline{\quad}$ B. C. D.

$\frac{2e + f}{+} = \underline{\quad}$ E. A. B.

$\frac{3e - f}{-} = \underline{\quad}$ C. F. G.

$\frac{b + e}{+} = \underline{\quad}$ B. D. E.

$\frac{b - d}{-} = \underline{\quad}$ B. F. C.

$\frac{3d - b}{-} = \underline{\quad}$ A. B. F.

$\frac{3e + 3f}{+} = \underline{\quad}$ H. G. F.

$\frac{3f \times 2}{\times 2} = \underline{\quad}$ C. H.

$\frac{c \times 3}{\times 3} = \underline{\quad}$ A. E.

$\frac{3e \div 2}{\div 2} = \underline{\quad}$ C. G.

$\frac{a \div 10}{\div 10} = \underline{\quad}$ F.

	A.	B.	C.	D.	E.
F.	$\frac{1}{10}$	$\frac{9}{10}$	$\frac{1}{4}$	$\frac{1}{6}$	$\frac{7}{10}$
G.	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{10}$	$\frac{1}{5}$	$\frac{2}{5}$
H.	$\frac{1}{3}$	$\frac{1}{8}$	$\frac{3}{5}$	$\frac{3}{4}$	1

From Easier $\xrightarrow{\text{to}}$ more Difficult

From Easier
$\downarrow$to
more Difficult

100%	1%	2%	3%	4%	5%	6%
\$ 1.00	\$ .01	\$ .02	\$ .03	\$ A.	\$ B.	\$ C.
\$ .50	\$ .00$\frac{1}{2}$	\$	\$ .01$\frac{1}{2}$	\$	\$ .02$\frac{1}{2}$	\$ D.
\$ 1.50	\$ .01 $\frac{1}{2}$	\$ D.	\$ A.	\$ C.	\$	\$ E.
\$ 3.00	\$ D.	\$ C.	\$ E.	\$	\$	\$ E.

100 %	101 %	102%	103%	104%	105%	106%
\$ 1.00	\$ 1.01	\$ 1.02	\$ E.	\$ A.	\$	\$ B.
\$ .50	\$ .50$\frac{1}{2}$	\$ .51	\$ .51$\frac{1}{2}$	\$ C.	\$	\$ C.
\$ 1.50	\$ 1.51$\frac{1}{2}$	\$ D.	\$ C.	\$ D.	\$ 1.57$\frac{1}{2}$	\$ D.
\$ 3.00	\$ 3.03	\$ A.	\$	\$ B.	\$	\$ E.

(x3) 27 (x2)

(x2) 18 (x3)

(÷2) 27 (÷3)

(-75) (+25) 50

(-8) 34 (-14)

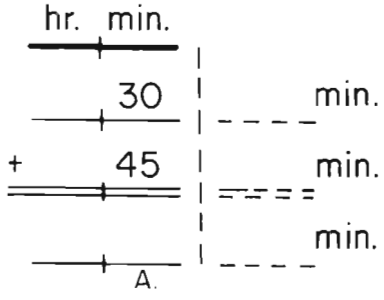
(-14) 28 (-8)

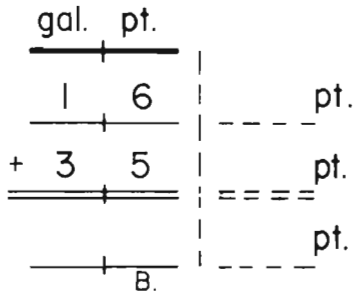
	A.	B.	C.	D.	E.
F.	1.04	1.52$\frac{1}{2}$	.06	1.56	1.03
G.	.04	3.12	.53	.03	3.18
H.	3.06	.05	1.54$\frac{1}{2}$	1.59	.09
I.	.04$\frac{1}{2}$	1.06	.52	1.53	.18

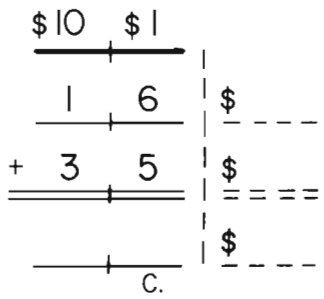
+, −, × and ÷ Measurements

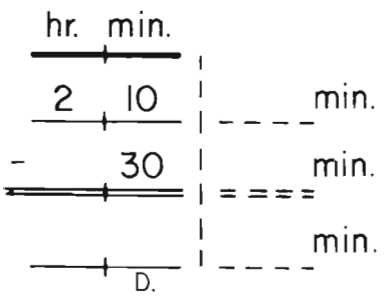
1 hour = 60 minutes

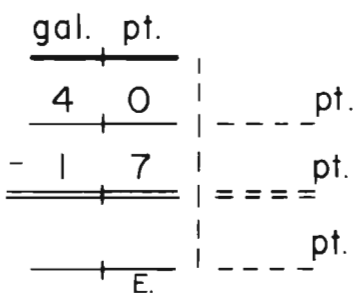
1 gallon = 8 pints

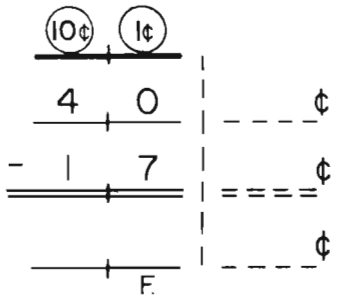


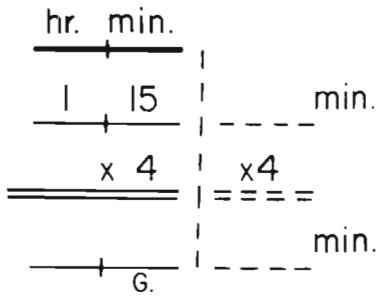


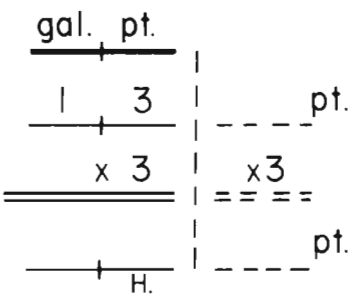


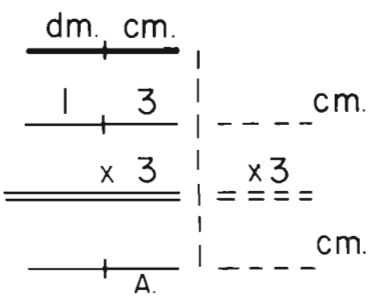


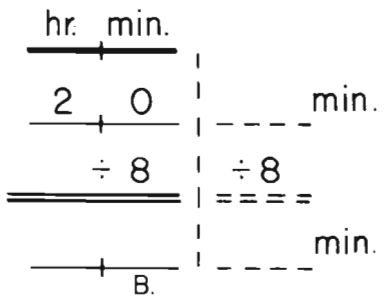


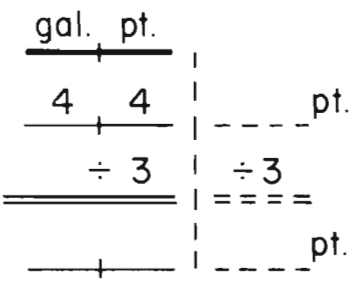


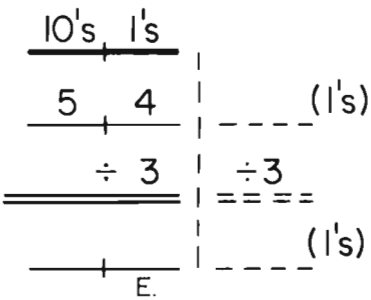


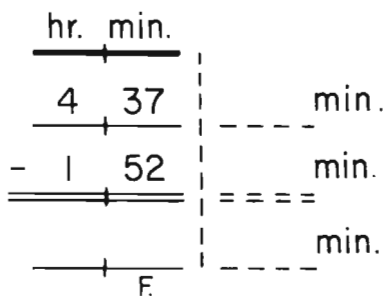


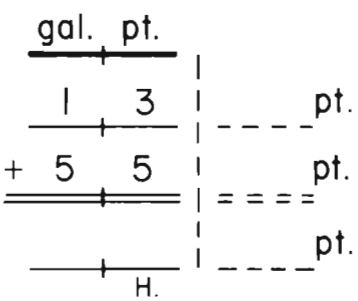












	A.	B.	C.	D.	E.
F.	2,45	3,3	5,1	2,3	1,8
G.	3,9	5,3	5,0	1,6	2,1
H.	1,15	0,15	4,1	1,40	7,0

Estimation . . . or "coming close" . . . with easier arithmetic.

12 x 18 =				(How close?)	Getting an exact result
-2	-2	→	10 x 16 =	_____A. (-56)	18 x 12
+2	+2	→	14 x 20 =	_____B. (+64)	
-2	+2	→	10 x 20 =	_____C. (-16) x	

x "closest"

9 x 14 =				
+4	-4	→	13 x _____ =	_____D. (+4) x
+1	+1	→	10 x _____ =	_____E. (+24)
+1	-1	→	10 x _____ =	_____G. (+4) x

14 x 9

18 x 23 =				
+2	+2	→	_____ x 25 =	_____ ( )A.
+2	-2	→	_____ x 21 =	_____ ( )B.
+2	-3	→	_____ x 20 =	_____ ( )C.

23 x 18

17 x 32 =				
+3	-1	→	20 x _____ =	_____A. ( )
+3	-3	→	_____ x =	_____B. ( )A.
+3	-5	→	_____ x =	_____C. ( )B.
+4	-2	→	_____ x 30 =	_____ ( )
+2	-2	→	_____ x =	_____ ( )D.
+1	-2	→	_____ x =	_____F. ( )E.

	A.	B.	C.	D.
E.	+86	-4	200	150
F.	160	+6	540	+26
G.	620	580	-14	130
H.	+36	280	+66	+70

Please indicate the largest amount with an A in the tinted block;
the next largest with a B, the next with a C, and the smallest with a D.

18 days .....

Month of January .....

Three weeks .....

Two weeks and 5 days .....

Please find the difference in days between:

A and B: _____ (A.) da. A and C: _____ (D.) da.

A and D: _____ (B.) da. B and C: _____ (E.) da.

B and D: _____ (C.) da. C and D: _____ (F.) da.

100 nickels .....

Three dollars and 20 cents .....

14 quarters .....

280 pennies .....

Please find the difference in dimes between:

A and B: _____ (A.) dimes A and C: _____ (D.) dimes

A and D: _____ (B.) dimes B and C: _____ (E.) dimes

B and D: _____ (C.) dimes C and D: _____ (F.) dimes

There are 3 feet in 1 yard

One yard .....

Four feet .....

A half a yard .....

Three fourth of a yard .....

Please find the difference in inches between:

A and B: _____ (D.) in. A and C: _____ (C.) in.

A and D: _____ in. B and C: _____ in.

B and D: _____ (A.) in. C and D: _____ (J.) in.

Half a day .....

Forty-eight hours .....

1¼ days .....

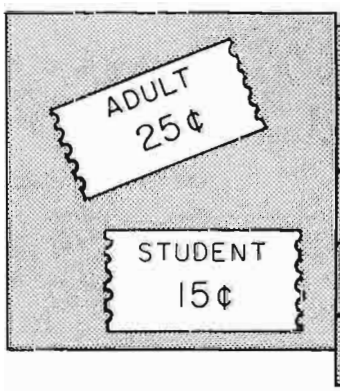
One day and 17 hours .....

Please find the difference in hours between:

A and B: _____ (A.) hr. A and C: _____ (A.) hr.

A and D: _____ (B.) hr. B and C: _____ (C.) hr.

B and D: _____ (C.) hr. C and D: _____ (I.) hr.

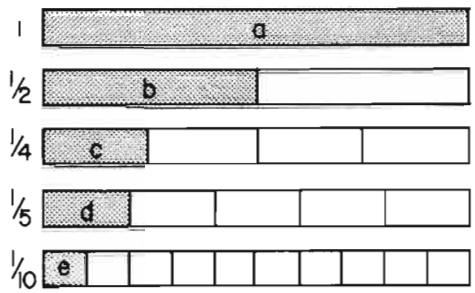


one of each	¢	D.
2 student, 1 adult	¢	E.
4 student, 2 adult	$.	D.
6 student, 3 adult	$.	E.
13 student	$.	F.

	A.	B	C.	D.	E.
F.	1.95	22	11	1	4
G.	10	30	7	40	2
H.	15	13	21	18	55
I.	18	36	3	1.10	3
J.	7	9	29	12	1.65

On Your Own (III)

175 + 392	37 x 9	37 x 12	101 x 63
750 - 195	148 x 6	_____	_____



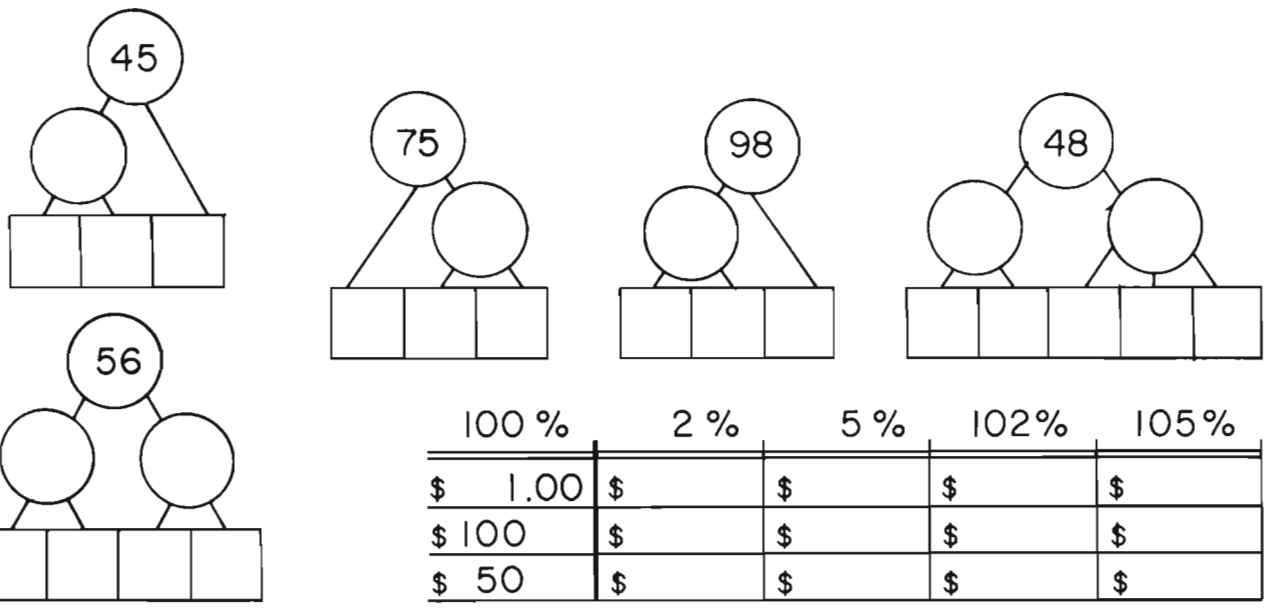
Please circle the letter after the line you think will be the best "estimate."

18 x 21	25 x 25
20 x 23 A.	20 x 30 D.
20 x 20 B.	20 x 25 E.
15 x 20 C.	30 x 30 F.

b - e = _____
- =

2d + e = _____
+ =

3e + e = _____
+ =



100 %	2 %	5 %	102%	105%
$ 1.00	$	$	$	$
$ 100	$	$	$	$
$ 50	$	$	$	$

How do you feel?

1 pound (lb.) = 16 ounces (oz.)

lb.	oz.	
3	0	_____ oz.
- 1	13	_____ oz.
		= = = =
_____		_____ oz.

lb.	oz.	
2	5	_____ oz.
x 4		x 4
		= = = =
_____		_____ oz.

If the results aren't interesting, then one of us goofed! . . . . . signed "GOOOOOFY"

26 × 9	81 × 3	54 × 6	36 × 9	54 × 8
72 × 6	81 × 4	47 × 9	57 × 6	38 × 9
117 × 2	108 × 4	171 × 2	162 × 2	114 × 3
144 × 3	141 × 3	216 × 2	108 × 3	39 × 6
18 × 13	19 × 18	27 × 12	18 × 18	36 × 12

Pairs of Single-Digit Whole Number Factors.

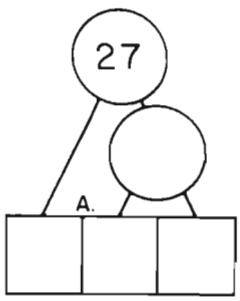
Rule: if not alike, please write the larger factor above the smaller factor.

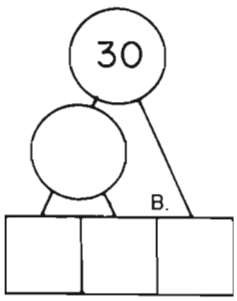
A.	B.	C.	D.	E.	F.		H.	I.	J.
X 25	X 14	X 28	X 56	X 18	X 6 36	X 36	X 72	X 32	X 64
X 30	F. X 49	X 21	E. X 42	A. X 63	X 24	X 24	D. X 48	F. X 81	H. X 72
F. X 35	D. X 45	X 27	C. X 54	F. X 81	X 40	X 4 16	X 2 16	H. X 48	J. X 64

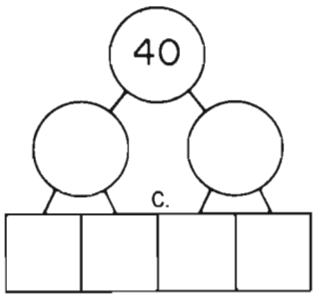
Taming frightfully big numbers . . .

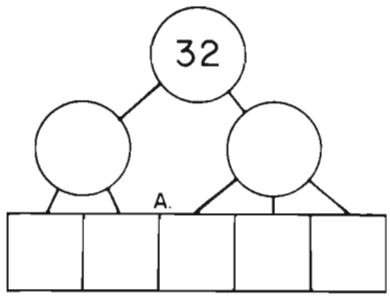
9 x 9 = 81	5 x 6 = 30	4 x 25 = 100
90 x 9 = A.	5 x 60 = E.	8 x 25 = C.
9 x 90 = G.	5 x 600 = F.	4 x 250 = D.
9 x 900 = B.	500 x 6 = H.	8 x 250 = E.
90 x 90 = K.	50 x 60 = F.	40 x 25 = K.
900 x 9 = B.	60 x 50 = H.	80 x 25 = I.

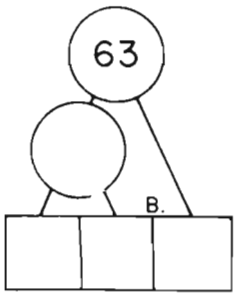
Factor Trees (excluding 1 as a factor)

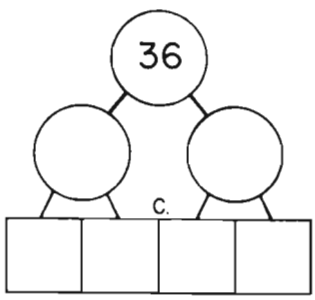






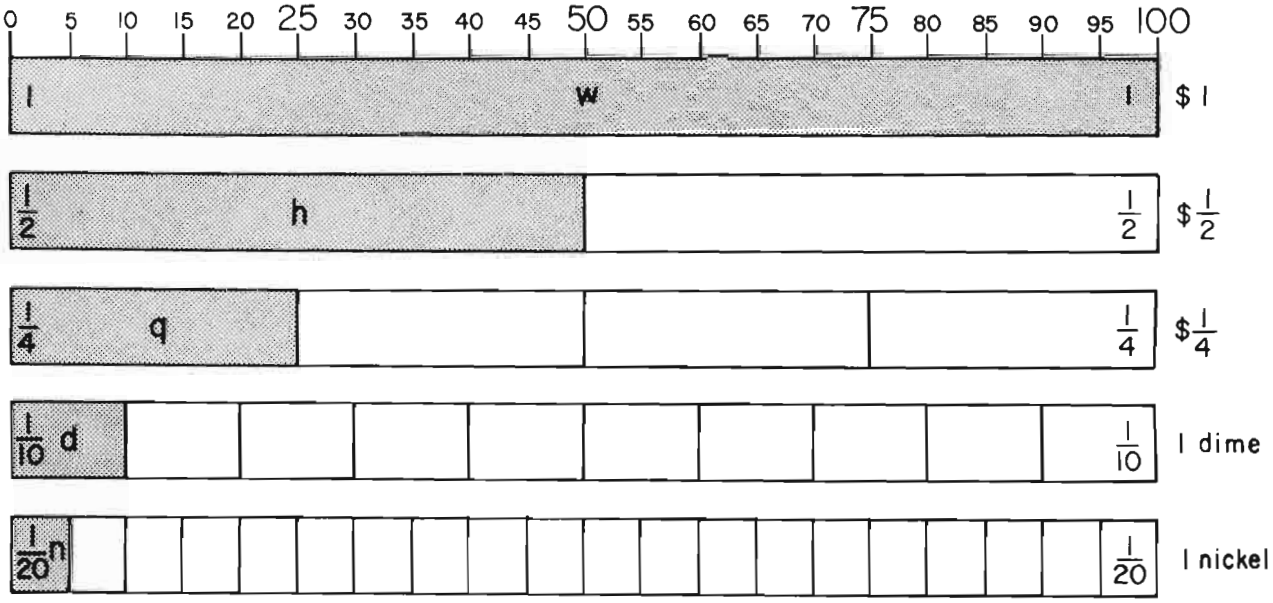






	A.	B.	C	D.	E.	F.
G.	810	2,3,5	9, 6	8,7	7, 6	7,7
H.	2,2,2,2,2	7,2	200	8,6	9,8	3,000
I.	5,5	3,3,7	2,2,3,3	8, 4	2,000	6,6
J.	9,7	8,8	7, 4	9,5	300	7,5
K.	3,3,3	8,100	2,2,2,5	1000	9, 2	9,9

What Can You See? . . . (suggested by U. S. coins)



$\frac{2d + n}{+} = \_\_\_$ F.

$\frac{h - q}{-} = \_\_\_$ F. C.

$\frac{q + 5n}{+} = \_\_\_$ F. E.

$\frac{w - 2d}{-} = \_\_\_$ E. F. A.

$\frac{q + n}{+} = \_\_\_$ C. A. D.

$\frac{3n + 7n}{+} = \_\_\_$ C. F.

$\frac{h - 3d}{-} = \_\_\_$ E. D. B.

$\frac{7d - q}{-} = \_\_\_$ G. F. A.

$\frac{3q - 4d}{-} = \_\_\_$ B. G. C.

$\frac{4d + 7n}{+} = \_\_\_$ B. C. B.

$\frac{9n - 4n}{-} = \_\_\_$ A. F.

$\frac{19n - 2q}{-} = \_\_\_$ H.

$\frac{3n \times 6}{\times 6} = \_\_\_$ F.

$\frac{2d \times 5}{\times 5} = \_\_\_$ B. H.

$\frac{h \div 5}{\div 5} = \_\_\_$ F. E.

$\frac{h \div 10}{\div 10} = \_\_\_$ E. F.

	A.	B.	C.	D.	E.
F.	$\frac{1}{20}$	$\frac{2}{10}$	$\frac{1}{4}$	$\frac{9}{10}$	$\frac{1}{2}$
G.	$\frac{8}{10}$	$\frac{4}{10}$	$\frac{7}{20}$	$\frac{7}{10}$	$\frac{1}{10}$
H.	$\frac{9}{20}$	$\frac{3}{4}$	$\frac{7}{10}$	$\frac{3}{10}$	1

From Easier → to more Difficult

From Easier ↓ to more Difficult

100 %	50%	25%	75%	10%	85%	95 %
$1000.00	$ 500	$ 250	$	$	$ 850	$ B.
$ 500.00	$ 250	$	$	$	$	$
$ 250.00	$ 125	$ E.	$ 187.50	$	$ A.	$ B.
$ 125.00	$ E.	$	$ D.	$	$ C.	$ D.

100 %	10 %	20%	30%	110 %	120 %	130 %
$ 575.00	$ 57.50	$	$ 172.50	$ D.	$ E.	$ A.
$ 17.40	$ 1.74	$ C.	$ A.	$ B.	$ C.	$ D.
$ 64.00	$ 6.40	$	$ B.	$	$	$
$ 850.00	$ A.	$	$	$ E.	$	$ E.

(-11) 19 (+) 28

(÷3) 7 (x) 14

30 (+) 39 (-11)

21 (x) 42 (÷3)

(+17) 32 (+8)

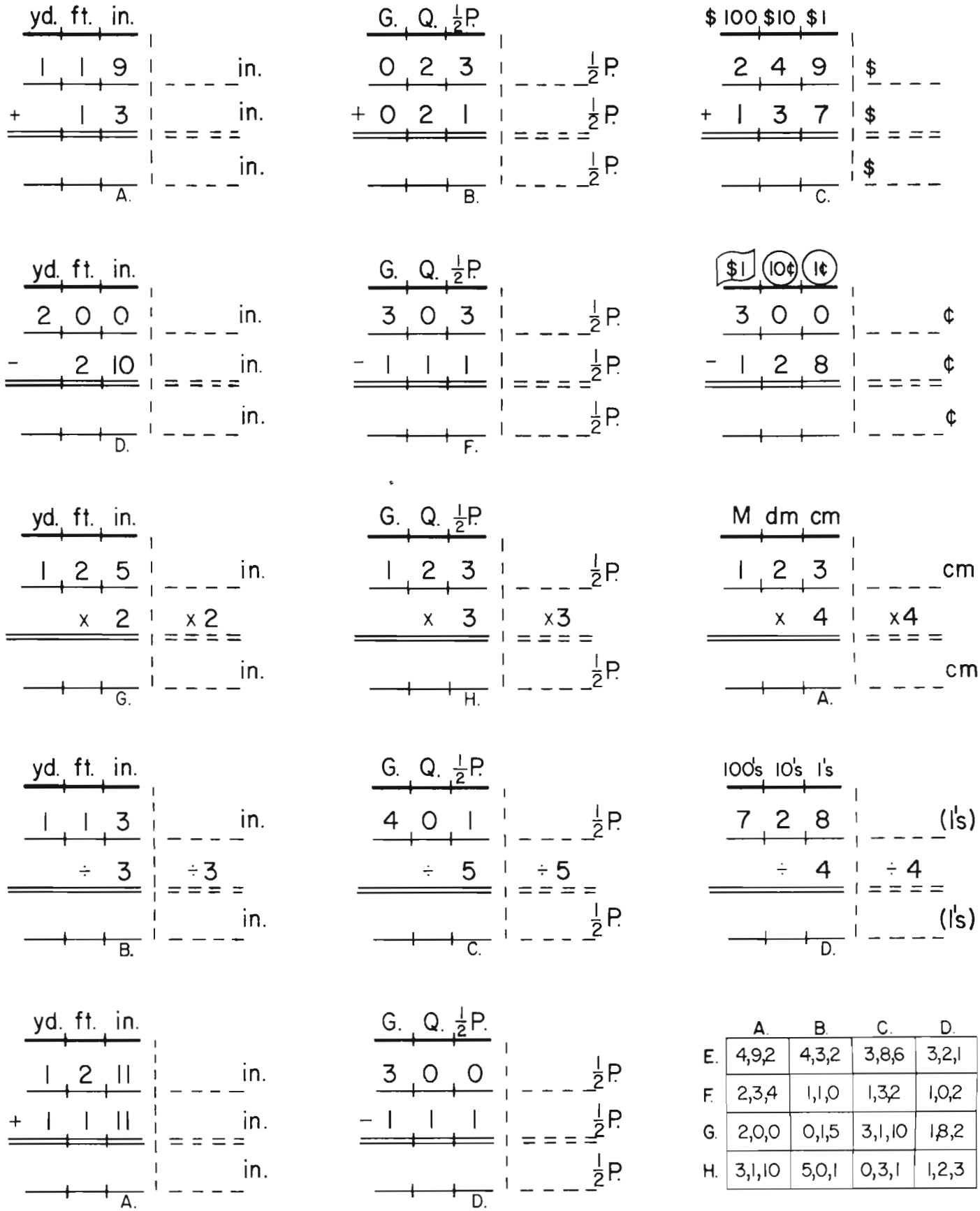
(+8) 23 (+17)

	A.	B.	C.	D.	E.
F.	212.50	19.20	3.48	93.75	62.50
G.	5.22	950.00	106.25	22.62	690.00
H.	85.00	237.50	20.88	632.50	1105
I.	747.50	19.14	115.00	118.75	935

+, −, × and ÷ Measurements

1 yard = 3 feet, 1 foot = 12 in.

1 gallon = 4 quarts, 1 quart = 4 half-pints



	A.	B.	C.	D.
E.	4,9,2	4,3,2	3,8,6	3,2,1
F.	2,3,4	1,1,0	1,3,2	1,0,2
G.	2,0,0	0,1,5	3,1,10	1,8,2
H.	3,1,10	5,0,1	0,3,1	1,2,3

Estimation

. . . or "coming close" . . . with easier arithmetic.

423 ÷ 9 =

					(How close?)
+27	+1	→	÷	=	( )A.
-23	+1	→	÷	=	( )B.
		→	440 ÷ 11	=	( )F.

Getting an exact result

$9\overline{)423}$ C.

---

684 ÷ 18 =

+16	+2	→	÷	=	( )D.
		→	650 ÷ 20	=	( )A.
-84	-3	→	÷	=	( )B.

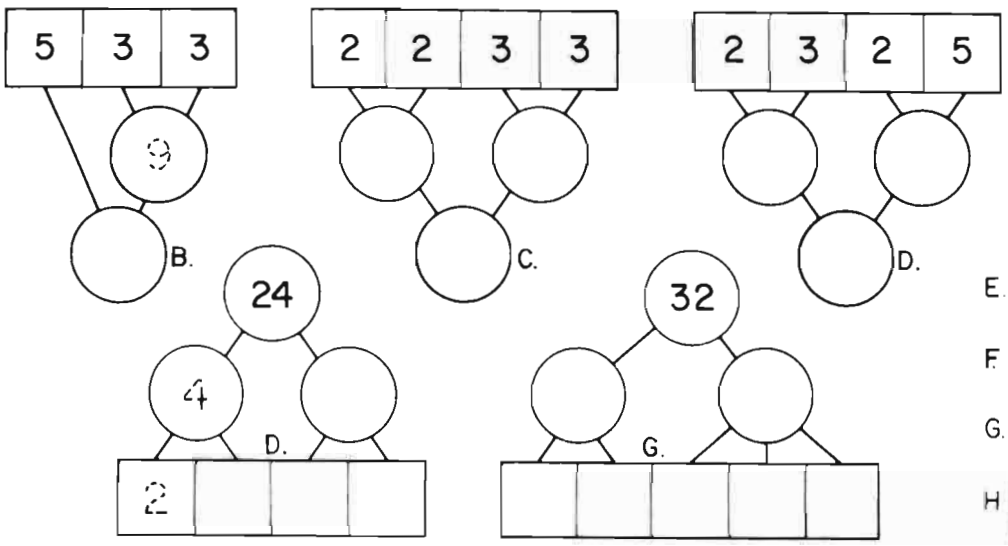
$18\overline{)684}$

1265 ÷ 55 =

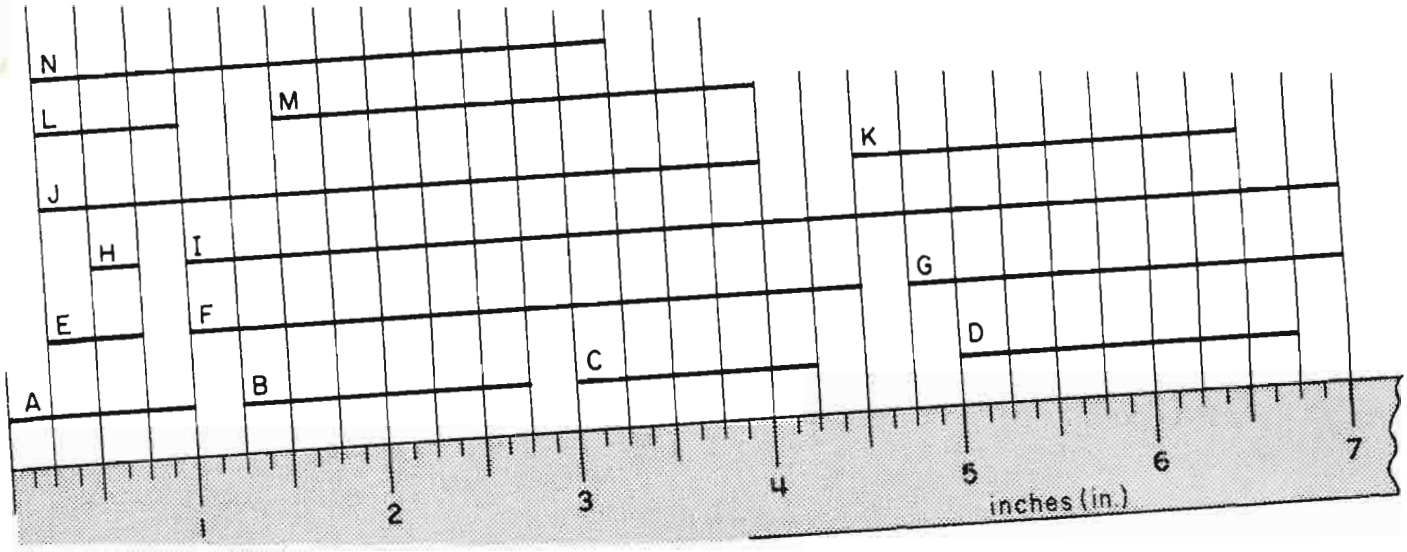
-65	-5	→	÷	=	( )C.
-65	+5	→	÷	=	( )D.
-5	-5	→	÷	=	( )

$55\overline{)1265}$ B.

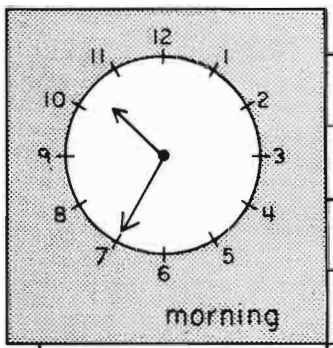
Factor Trees (excluding 1 as a factor)



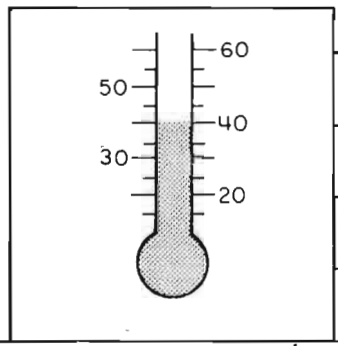
	A.	B.	C.	D.
E.	$-5\frac{1}{2}$	45	+1	2,2,2,3
F.	+1	-7	36	-3
G.	-1	+2	47	2,2 2,2,2
H	-2	23	38	60



Lengths of lines shown		Sums of lengths	Differences of lengths
A: ____ in. a.	H: ____ in. a.	A and B: ____ in.	A and B: ____ in. a.
B: ____ in.	I: ____ in.	C and D: ____ in. d.	C and D: ____ in. a.
C: ____ in. d.	J: ____ in.	E and F: ____ in.	F and G: ____ in. d.
D: ____ in.	K: ____ in.	G and M: ____ in. d.	H and I: ____ in.
E: ____ in. a.	L: ____ in. c.	E and J: ____ in. c.	K and L: ____ in. d.
F: ____ in. c.	M: ____ in.	L and M: ____ in.	M and N: ____ in. a.
G: ____ in. d.	N: ____ in.	D and J: ____ in.	F and J: ____ in. a.



time shown	20 minutes later
10:35 a.m.	: a.m. b.
2 hours later	100 min. later
: p.m. b.	: b.
1¼ hr. earlier	12 hr. later
: b.	: b.



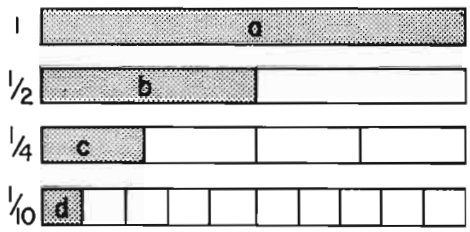
temperature shown	38° warmer
40°	° c.
7° colder	°
° a.	68°

a.	b.	c.	d.
½	12:35	¾	2¼
1	10:55	1¾	3
¼	12:15	78	1¼
33	10:35	4¼	10
2¾	9:20	3½	4¾

$$\begin{array}{r} 2468 \\ 2468 \\ 2468 \\ +2468 \\ \hline \end{array}$$

$$\begin{array}{r} 123 \\ \times \quad 4 \\ \hline \end{array}$$

$4\overline{)728}$ $18\overline{)666}$



Please circle the letter after the line you think will be the best "estimate."

329 ÷ 17	
300 ÷ 15	A.
300 ÷ 20	B.
350 ÷ 15	C.

275 ÷ 28	
300 ÷ 25	D.
240 ÷ 30	E.
250 ÷ 25	F.

$a - 3c =$ ____

$3d + 2d =$ ____

$7d + 3d =$ ____

$4 \times 5 =$ ____

$4 \times 50 =$ ____

$40 \times 50 =$ ____

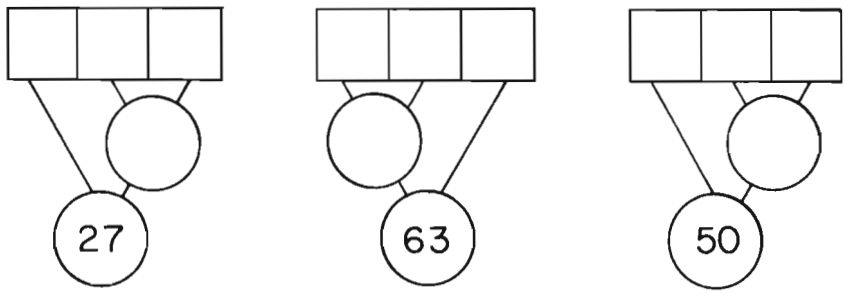
$4 \times 25 =$ ____

$40 \times 25 =$ ____

$4 \times 250 =$ ____

$40 \times 500 =$ ____

$40 \times 250 =$ ____



100 %	50 %	125 %	10 %	150 %
$ 500	$	$	$	$
$ 10	$	$	$	$
$400	$	$	$	$

1 yard = 3 feet

1 foot = 12 inches

yd.	ft.	in.	
1	1	10	____ in.
+ 1	1	11	____ in.
			____ in.

How do you feel?

yd.	ft.	in.	
1	1	7	____ in.
		x 2	x 2
			____ in.

If the results aren't interesting
then one of us goofed!. . . . . signed "GOOOOOFY"

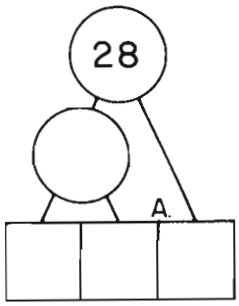
168 × 2 A.	378 × 2 B.	693 × 2 C.	728 × 2 D.	48 × 7 A.	108 × 7 B.
112 × 3 C.	252 × 3 D.	462 × 3 A.	364 × 4 B.	198 × 7 C.	208 × 7 D.
84 × 4 A.	126 × 6 B.	154 × 9 C.	182 × 8 D.	42 × 8 A.	84 × 9 B.
231 × 6 C.	56 × 6 D.	364 × 4 A.			

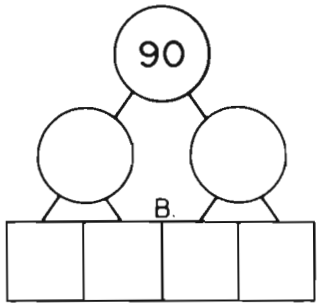
63 × 12 D.	12 × 28 A.	54 × 14 B.
14 × 24 A.	36 × 21 B.	104 × 14 C.

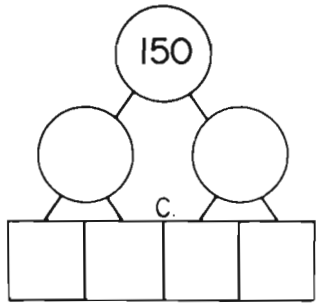
21 × 16 B.	42 × 18 C.	
28 × 27 C.	112 × 13 D.	

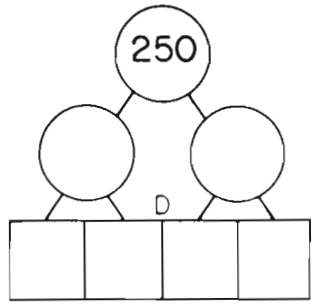
	A.	B.	C.	D
E.	336	756	1386	1456
F.	1386	1456	336	756
G.	1456	336	756	1386
H.	756	1386	1456	336

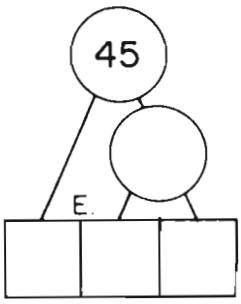
Factor Trees (excluding 1 as a factor) . . . you may need scratch paper

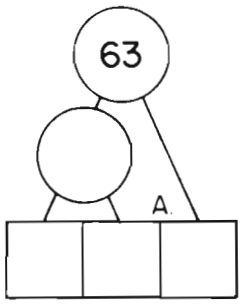


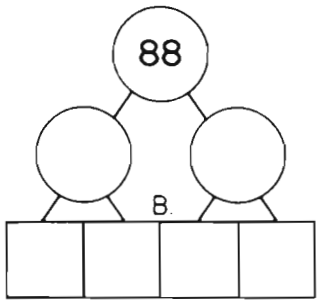


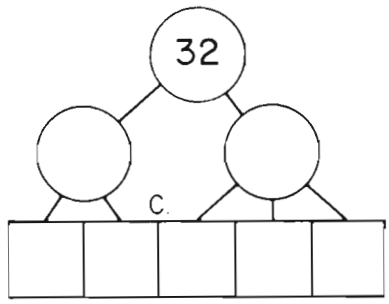


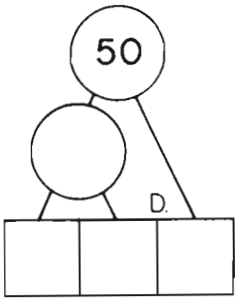


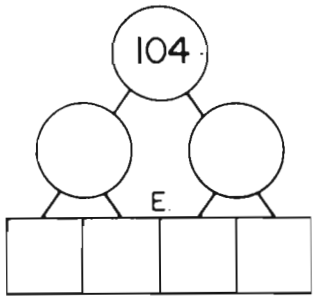


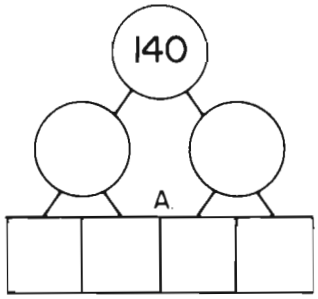


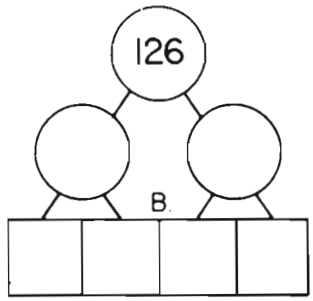


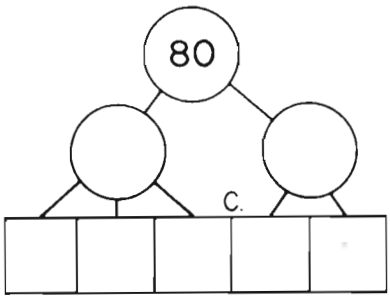


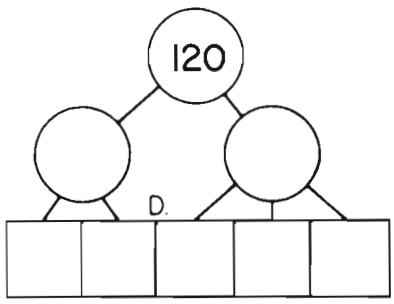


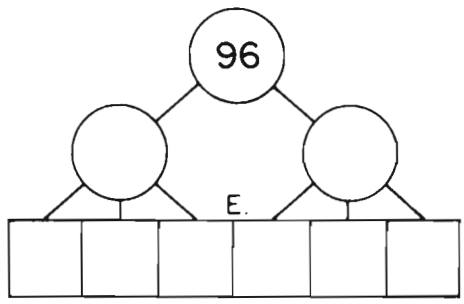


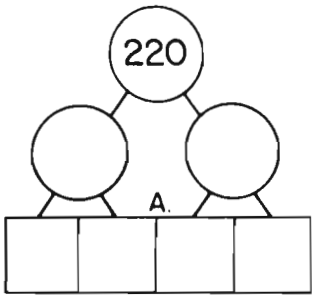


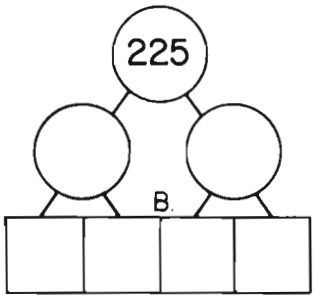






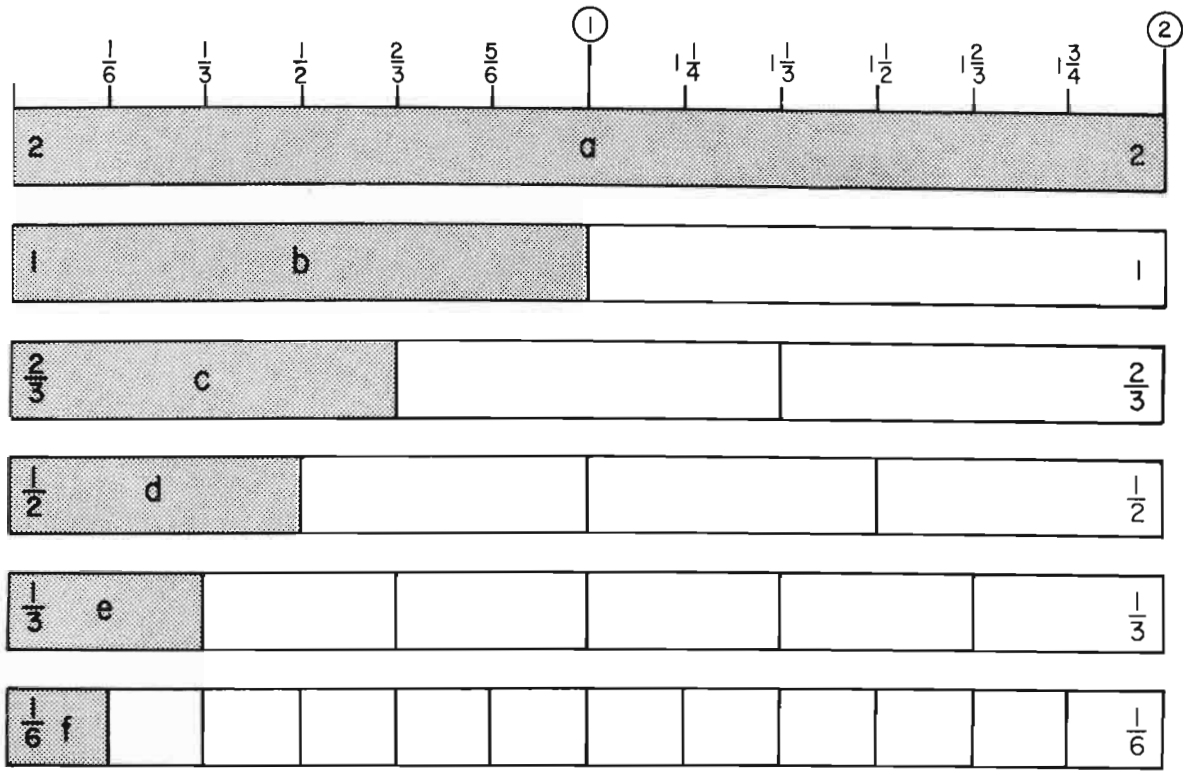






A.	B.	C.	D.	E.
2,2,7	3,3,5,5	2,3,5,11	2,2 2,3,5	3,3,5
2,2,5,7	2,2,2,11	2,3,5,5	2,3,11	5,5,5,5
2,2,5,11	2,3,3,5	2,2 2,2,5	2,5,5	2,2,2,13
3,3,7	2,3,3,7	2,2 2,2,2	2,5,5,5	2,2,2 2,2,3

What Can You See?



$\frac{b + d}{1 + \frac{1}{2}} = \frac{3d}{1\frac{1}{2}}$

$\frac{c + c}{+} = \frac{2c}{=}$ (A. H. C.)

$\frac{a - e}{-} = \frac{\quad}{=}$ (A. A.)

$\frac{3d - f}{-} = \frac{\quad}{=}$ (F. B. C.)

$\frac{d - e}{-} = \frac{\quad}{=}$ (G. A. G.)

$\frac{2c + f}{+} = \frac{\quad}{=}$ (C. G. F.)

$\frac{3d - 3f}{-} = \frac{\quad}{=}$ (F. E. G.)

$\frac{a - 3d}{-} = \frac{\quad}{=}$ (E. F. G.)

$\frac{4e - 3f}{-} = \frac{\quad}{=}$ (C. E. I.)

$\frac{c \times 3}{\times 3} = \frac{\quad}{=}$ (A.)

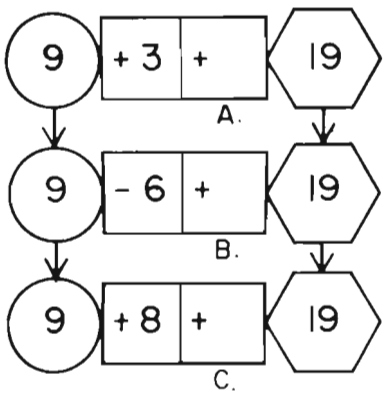
$\frac{5e \div 2}{\div 2} = \frac{\quad}{=}$ (G. C.)

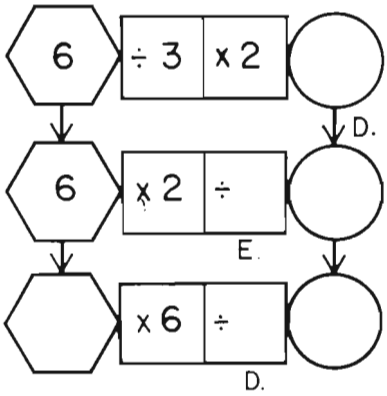
$\frac{3d \div 3}{\div 3} = \frac{\quad}{=}$ (F. G.)

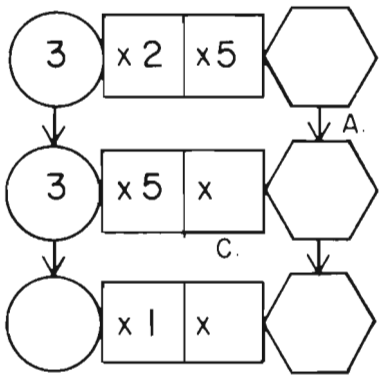
$\frac{d \times 5}{\times 5} = \frac{\quad}{=}$ (E. D.)

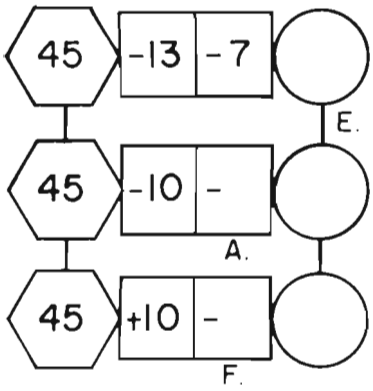
	A.	B.	C.	D.	E.	F.
G.	$1\frac{2}{3}$	$\frac{1}{6}$	$\frac{4}{3}$	$\frac{5}{3}$	$\frac{1}{2}$	1
H.	$\frac{2}{3}$	$\frac{1}{4}$	$1\frac{1}{3}$	$\frac{5}{2}$	$\frac{3}{6}$	$1\frac{1}{2}$
I.	$\frac{1}{3}$	$\frac{3}{4}$	$\frac{5}{6}$	$2\frac{1}{2}$	2	$\frac{3}{2}$

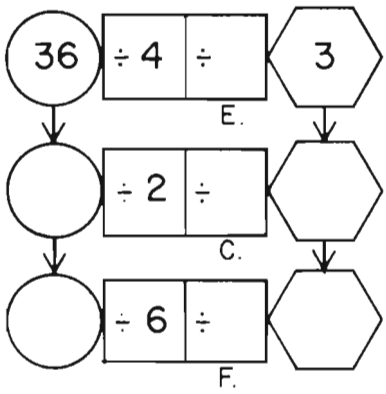
Equal Chain Reactions

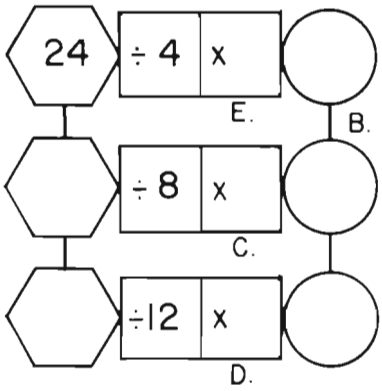


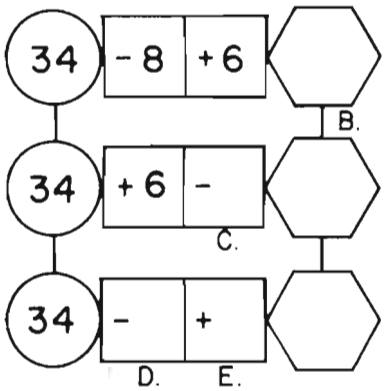


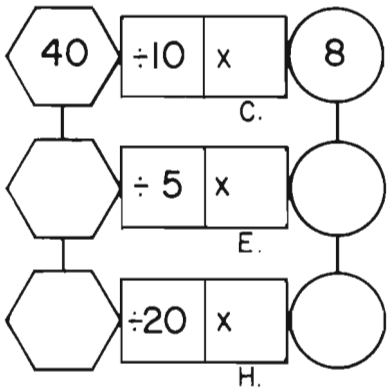


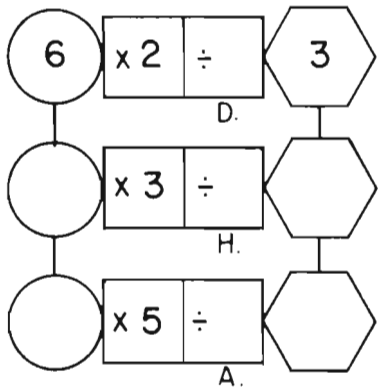


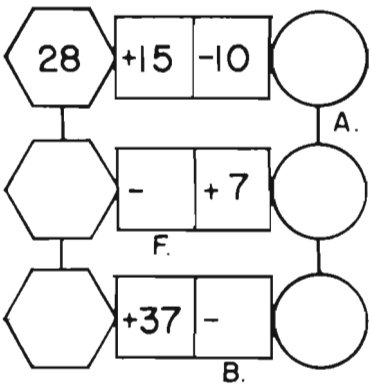


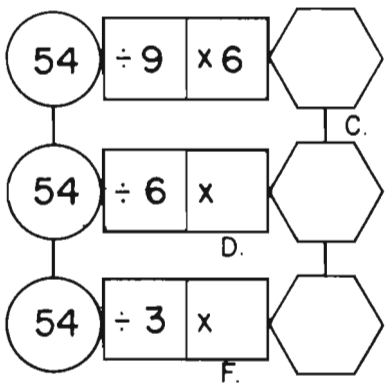






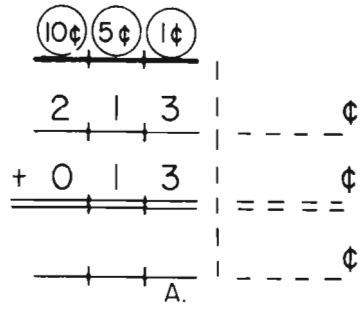


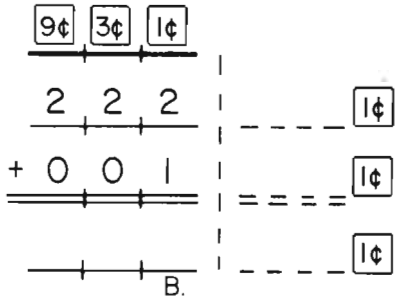


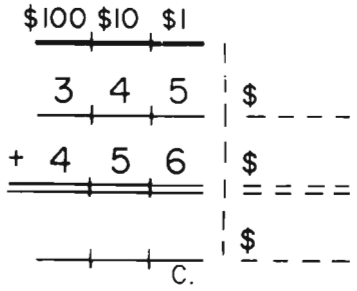


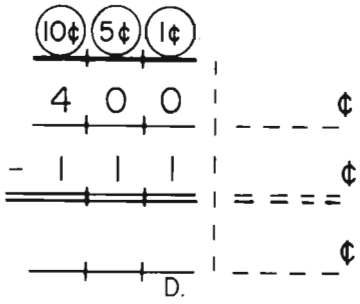
	A.	B.	C.	D.	E.
F.	30	13	2	5	25
G.	7	18	36	9	3
H.	33	32	6	4	9
I.	10	16	8	11	1

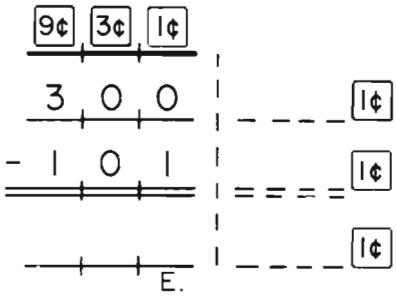
+, −, × and ÷ Measurements

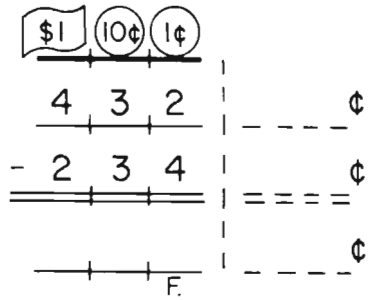


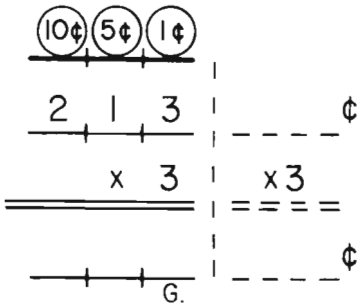


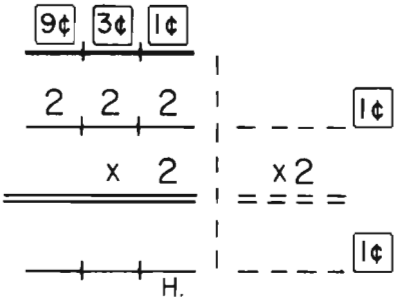


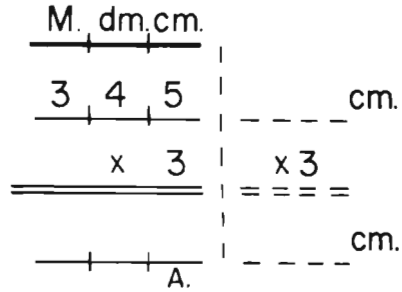


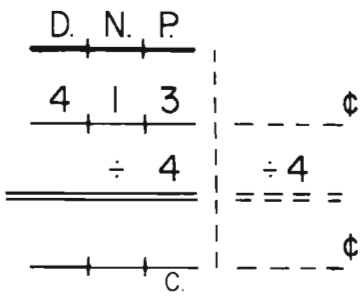


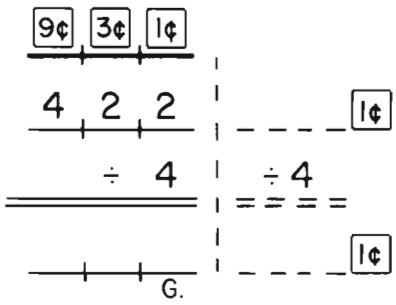


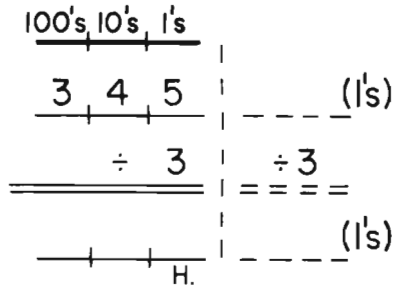


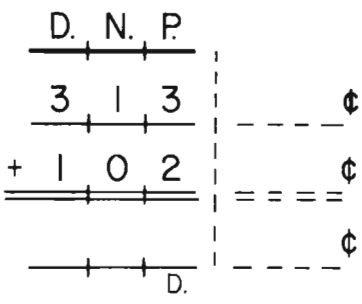


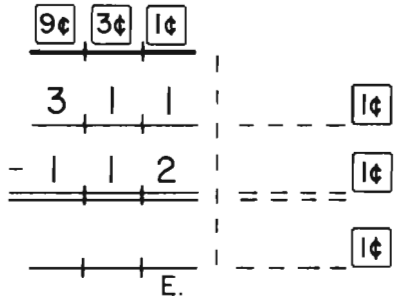












	A.	B.	C.	D.
E.	3,1,1	1,2,2	1,2,2	2,2,3
F.	3,4,5	1,9,8	8,0,1	5,0,0
G.	5,4,3	8,0,4	1,0,2	2,0,4
H.	10,3,5	3,0,0	5,2,1	1,1,5

Estimation

. . . or "coming close" . . . with easier arithmetic.

23 x 27 =

					(How close?)	Getting an exact result
-3	-7	→	___ x ___	= ___	( )A.	27 x23
-3	+3	→	___ x ___	= ___	( )B.	
+2	+3	→	___ x ___	= ___	( )C.	___ D.

48 x 94 =

+2	+6	→	___ x ___	= ___	( )A.	94 x48
+2	-4	→	___ x ___	= ___	( )B.	
-8	-4	→	___ x ___	= ___	( )C.	___ D.

On Your Own

35 x 44 =

		→	___ x ___	= ___	( )	44 x35
		→	___ x ___	= ___	( )	
		→	___ x ___	= ___	( )	___ D.

Taming frightfully big numbers . . .

10x17 = ___ A.	8x9 = ___ B.	100x10 = ___ C.
17x10 = ___ H.	80x9 = ___	100x100 = ___ C.
100x17 = ___ B.	8x90 = ___	
10x170 = ___ G.	80x90 = ___	
100x34 = ___	80x900 = ___	
34x100 = ___	90x800 = ___	
100x49 = ___ A.	90x400 = ___ D.	

	A.	B.	C.	D.
E.	4900	72	+129	36,000
F.	-221	-12	1,000	621
G.	+488	1700	-912	1540
H.	170	-21	10,000	4,512

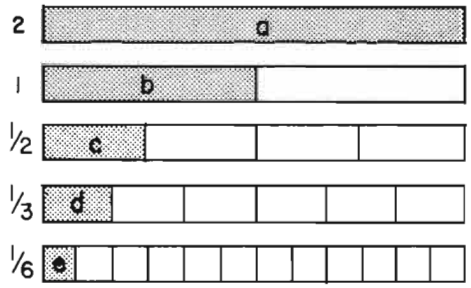
On Your Own (V)

$$\begin{array}{r} 357 \\ +\ 246 \\ \hline \end{array}$$

$$\begin{array}{r} 753 \\ -\ 468 \\ \hline \end{array}$$

$$\begin{array}{r} 182 \\ \times\ 8 \\ \hline \end{array}$$

$$\begin{array}{r} 112 \\ \times\ 13 \\ \hline \end{array}$$



Please circle the letter after the line you think will be the best "estimate."

35 x 75	
30 x 80	A.
40 x 80	B.
30 x 70	C.

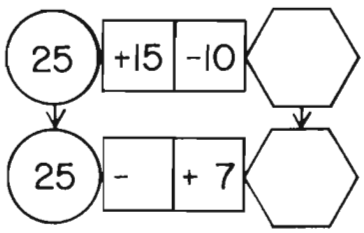
27 x 54	
25 x 55	D.
25 x 50	E.
30 x 50	F.

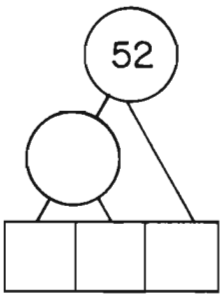
b + d = _____
=

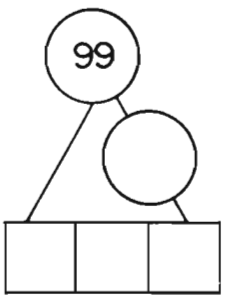
4e - d = _____
=

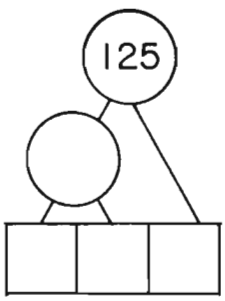
b ÷ 3 = _____
=

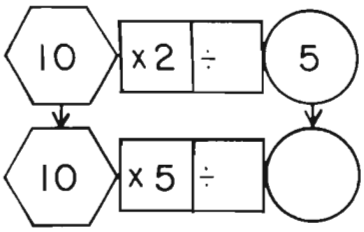
Equal Chain Reactions

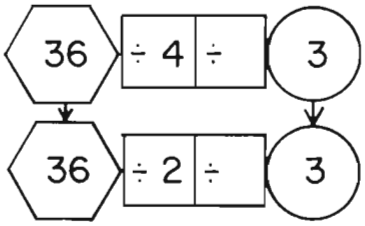


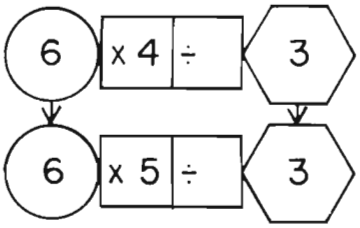


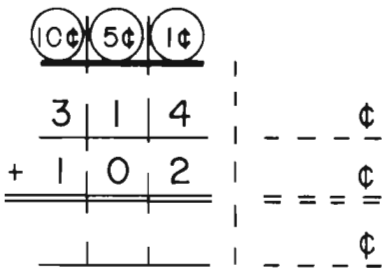


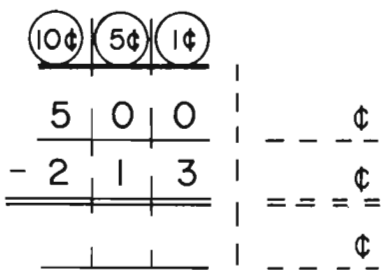












How do you feel?

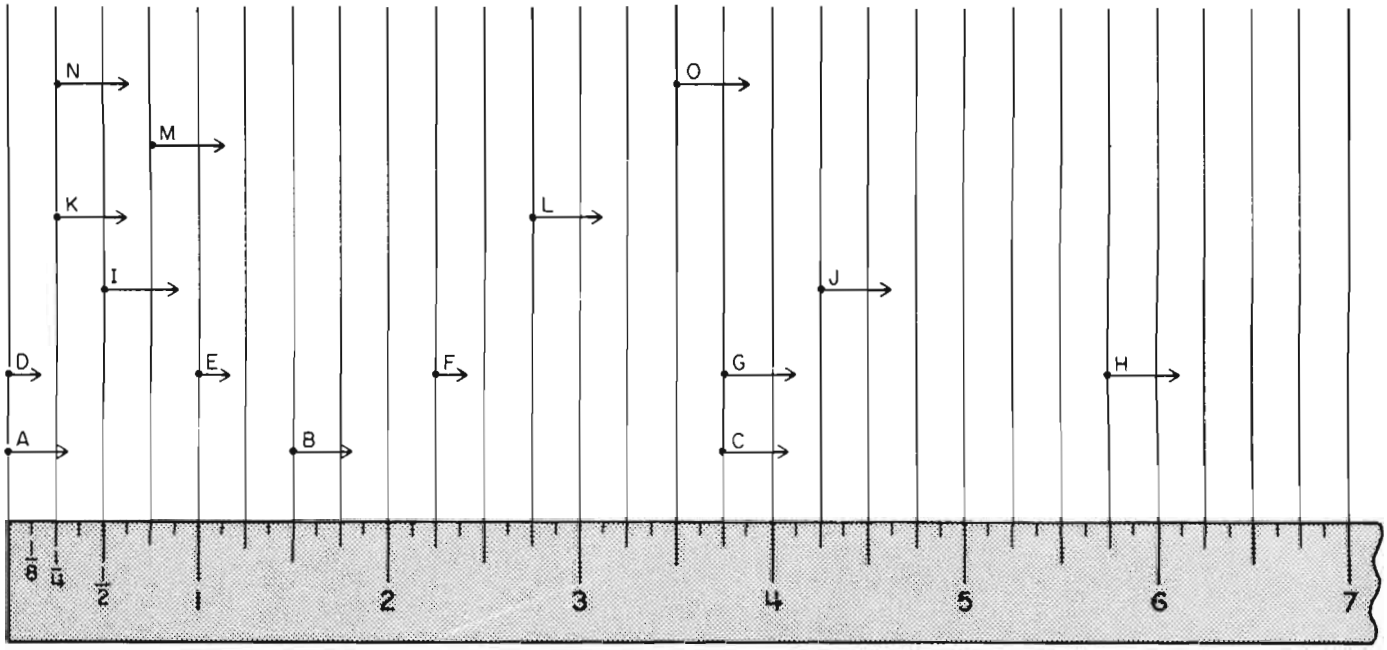
If the results aren't interesting
then one of us goofed! . . . signed "GOOOOOFY"

432 x 8	648 x 7	727 x 9	1059 x 6	576 x 6
288 x 12	96 x 36	192 x 18	297 x 19	165 x 21
64 x 54	143 x 45	149 x 36	72 x 63	99 x 65

Can you find other examples that belong to this family?

144 x ____ = 3456	x 35 = 3465	x ____	x ____	x ____

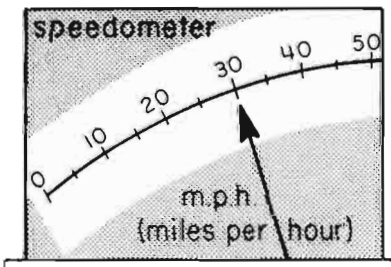
Please extend the lines to the right so they are as long as the chart below indicates.



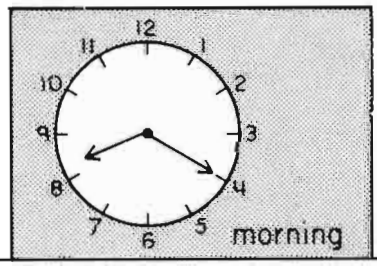
A: 1 in. B: $1\frac{1}{2}$ in. C: 3 in. D: $\frac{1}{2}$ in. E: $\frac{1}{4}$ in.

F: $\frac{3}{4}$ in. G: $1\frac{3}{4}$ in. H: $1\frac{1}{4}$ in. I: $3\frac{1}{4}$ in. J: $2\frac{1}{2}$ in.

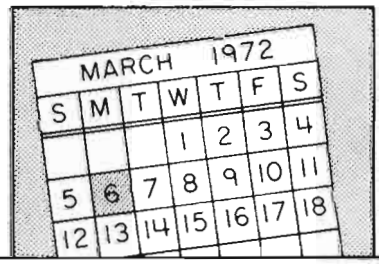
K: 2 in. L: $3\frac{1}{4}$ in. M: $5\frac{1}{2}$ in. N: $2\frac{1}{4}$ in. O: $3\frac{1}{2}$ in.



twice the speed shown.
_____ m.p.h.
½ the speed shown
_____ m.p.h.
⅓ the speed shown
_____ m.p.h.
¼ the speed shown
_____ m.p.h.



time shown
_____ : _____ a.m.
90 minutes later
_____ : _____
5 hr. and 10 min. later
_____ : _____
10 hours earlier
_____ : _____



2 weeks after March 6, 1972
_____ ___, 19___
1 week before March 6, 1972
_____ ___, 19___
30 days after March 6, 1972
_____ ___, 19___
4 weeks after March 6, 19___
_____ ___, 19___

Pairs of Single-Digit Whole Number Factors.

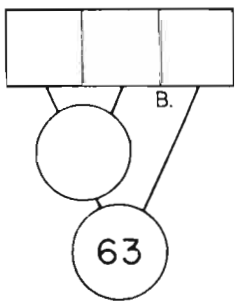
Rule: if not alike, please write the larger factor above the smaller factor.

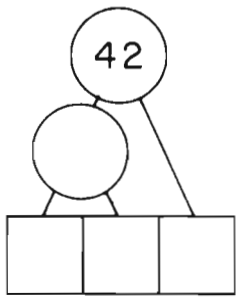
A.	B.	C.	D.	E.	F.	A.	C.	B.
x 5	x	x	x	x	x	x	x	x
30	49	35	63	48	32	72	40	35	81

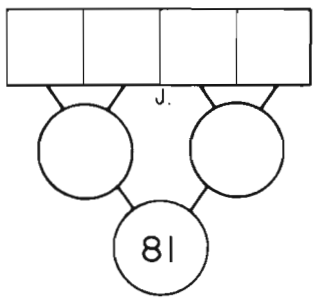
D.	E.	F.	B.	D.	D.	E.
x	x	x	x 4	x 6	x	x	x	x	x	x
54	64	40	36	36	49	42	56	63	48

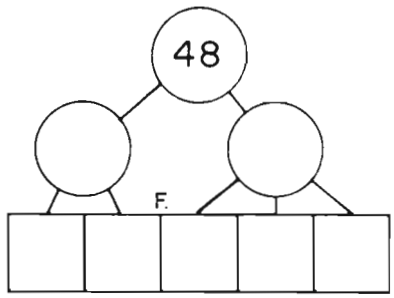
A.	D.	F.	B.	A.	I.	F.	D.
x	x	x	x	x	x	x	x	x	x
72	42	45	56	81	30	45	54	32	64

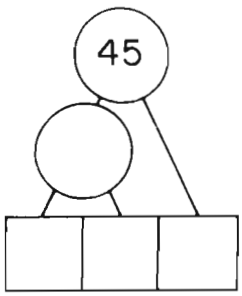
10 x 1 = 10	8 x 7 = G.	5 x 8 =
10 x 10 = A.	80 x 7 = A.	5 x 80 = I.
10 x 100 = B.	80 x 70 = H.	50 x 8 = C.
100 x 100 = K.	8 x 700 = E.	50 x 80 =
100 x 1000 = H.	80 x 700 = A.	50 x 800 =
1000 x 100 = D.	800 x 700 = G.	500 x 800 = B.

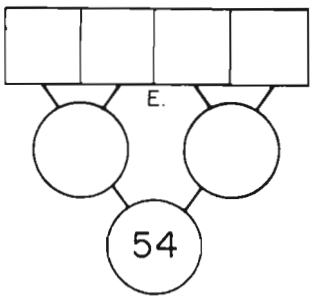






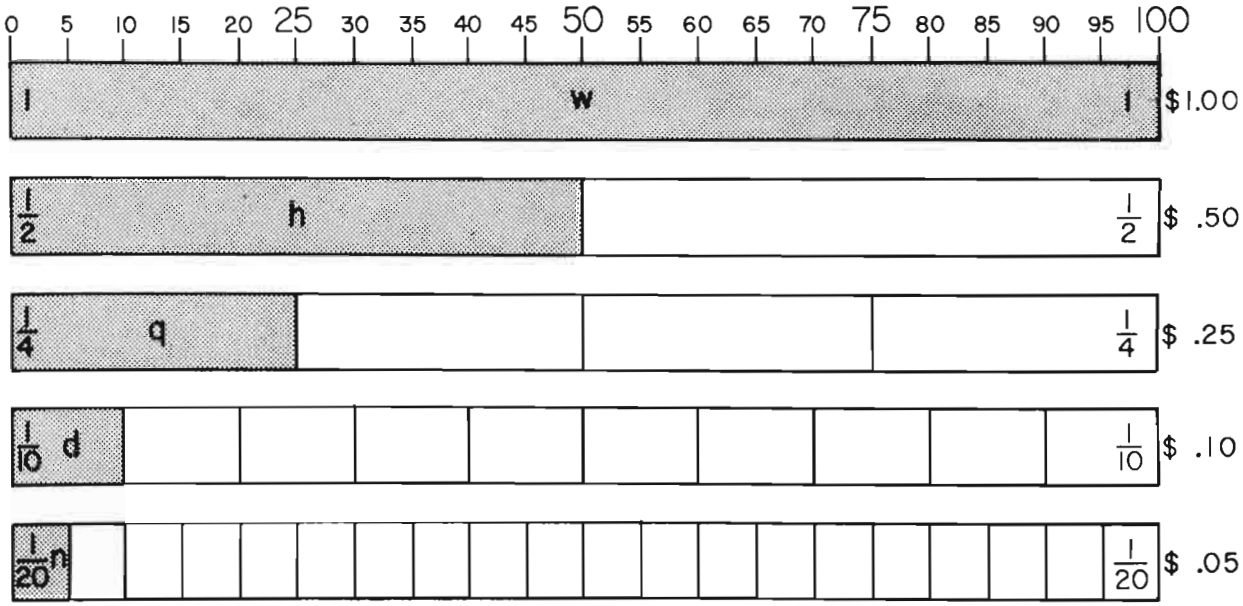






	A	B	C	D	E	F
G	100	9,9	560,000	56	6,8	6,6
H	5,6	400,000	6,4	100,000	5,600	4,8
I	560	7,7	400	8,8	2,3,3,3	5,9
J	56,000	3,3,7	5,7	6,7	4,9	3,3,3,3
K	8,9	1,000	10,000	7,9	200	3,2,2,2,2

What Can You See?



$\frac{3h - 3q}{\frac{3}{2} - \frac{3}{4}} = \frac{3q}{\quad}$ A.

$\frac{2ln - h}{- \frac{1}{2}} = \frac{\quad}{\quad}$ C. B.

$\frac{5q - 7n}{-} = \frac{\quad}{\quad}$ C.

$\frac{3d + 8d}{\frac{3}{10} +} = \frac{\quad}{\quad}$ D.

$\frac{3h + 3h}{+} = \frac{\quad}{\quad}$ I. I.

$\frac{11d + 2ln}{+} = \frac{\quad}{\quad}$ D. A. F.

$\frac{3q - ld}{-} = \frac{\quad}{\quad}$ A. F. A.

$\frac{13n + 3h}{+} = \frac{\quad}{\quad}$ A. I. F.

$\frac{2w - 9d}{-} = \frac{\quad}{\quad}$ E. C. H.

$\frac{7d \times 3}{\times 3} = \frac{\quad}{\quad}$ G. H.

$\frac{3q \times 4}{\times 4} = \frac{\quad}{\quad}$ A. G.

$\frac{3h \times 4}{\times 4} = \frac{\quad}{\quad}$ I. C.

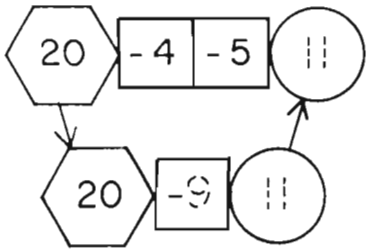
$\frac{2w \div 8}{\div 8} = \frac{\quad}{\quad}$ E. D.

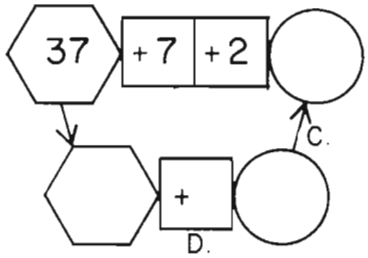
$\frac{9d \div 6}{\div 6} = \frac{\quad}{\quad}$ C. E.

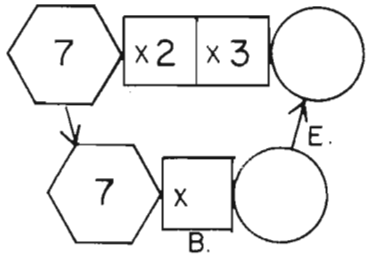
$\frac{3h \div 15}{\div 15} = \frac{\quad}{\quad}$ I. F.

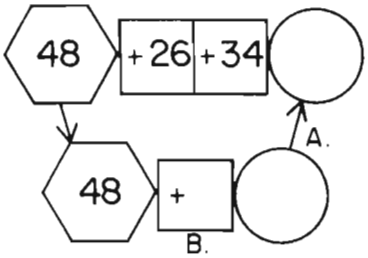
$\frac{3q \div 5}{\div 5} = \frac{\quad}{\quad}$ A. I.

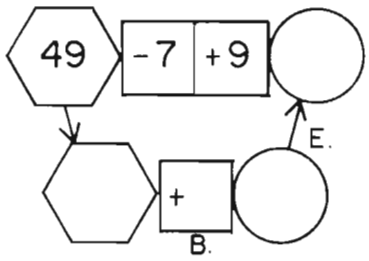
	A.	B.	C.	D.	E.	F.
G.	$1\frac{1}{20}$	$\frac{11}{20}$	$\frac{21}{20}$	$\frac{1}{4}$	3	$\frac{7}{10}$
H.	$\frac{3}{4}$	$2\frac{1}{10}$	6	$1\frac{1}{10}$	2	$2\frac{3}{20}$
I.	$\frac{13}{20}$	$\frac{3}{2}$	$\frac{9}{10}$	$1\frac{1}{2}$	$\frac{3}{20}$	$\frac{1}{10}$

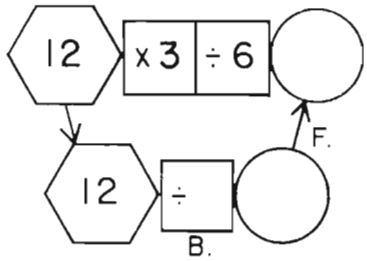


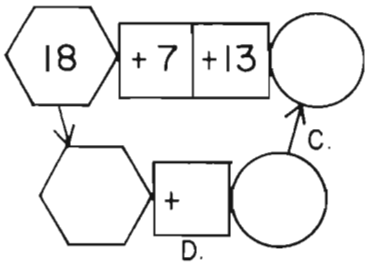


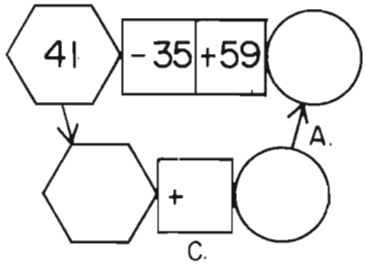


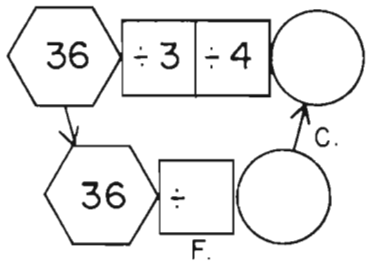


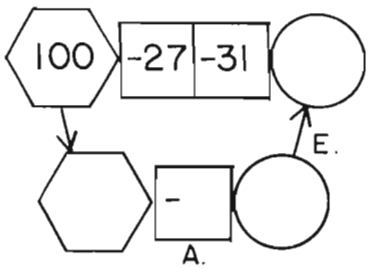


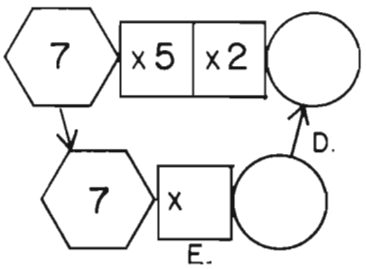


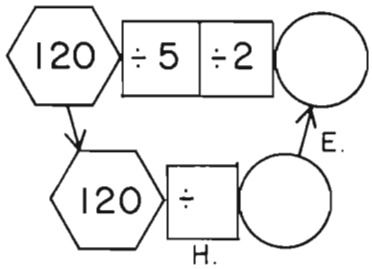


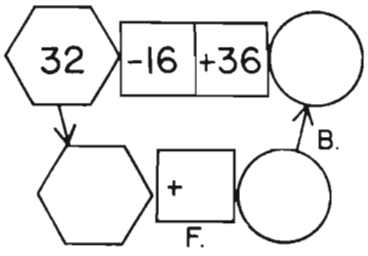


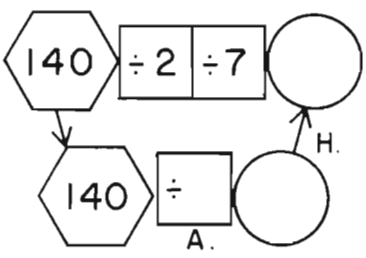










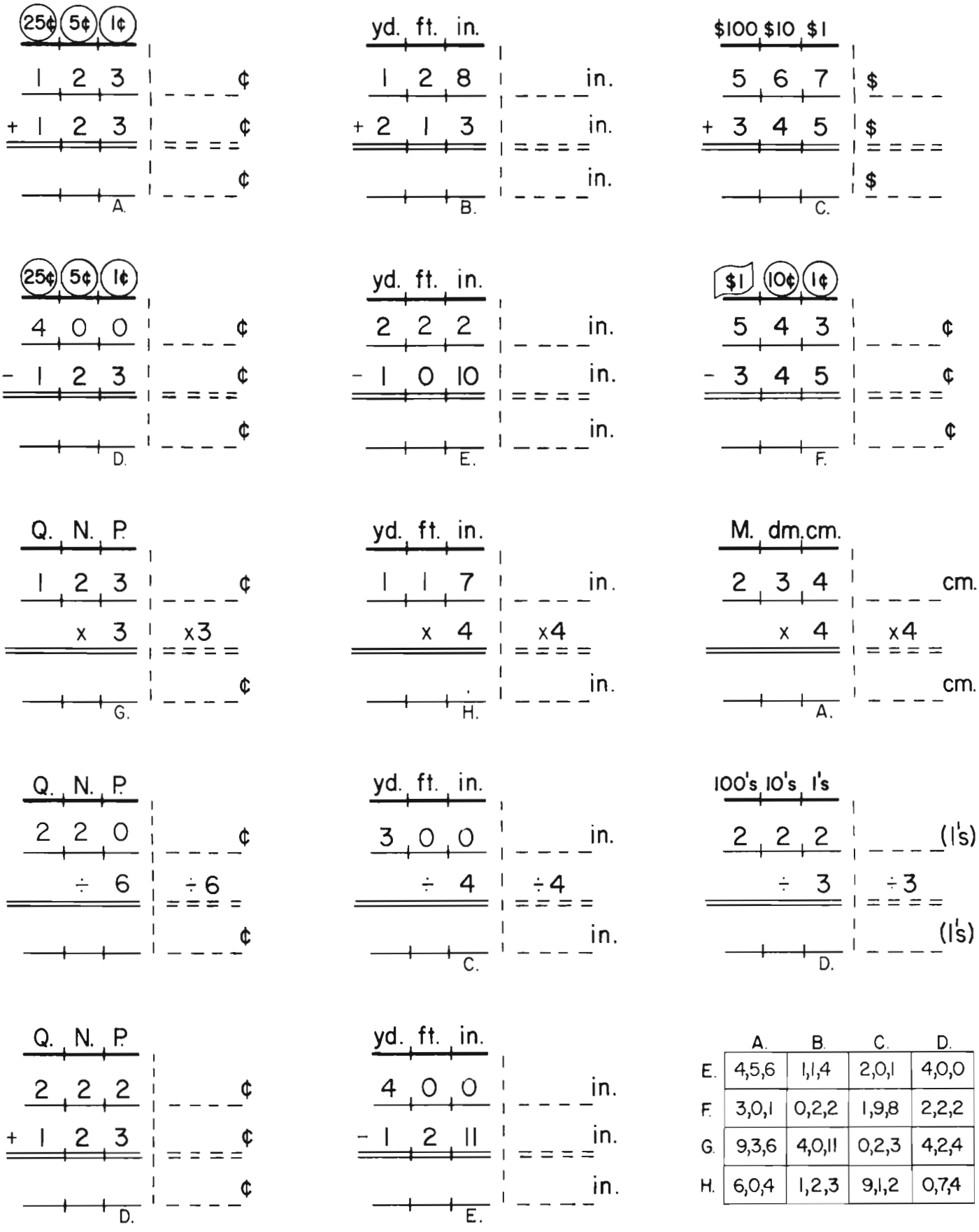


	A.	B.	C.	D.	E.
F.	65	6	46	20	12
G.	-58	60	3	70	51
H.	14	52	38	7	10
I.	108	2	24	9	42

+, −, × and ÷ Measurements

1 yard = 3 feet

1 foot = 12 inches



	A.	B.	C.	D.
E.	4,5,6	1,1,4	2,0,1	4,0,0
F.	3,0,1	0,2,2	1,9,8	2,2,2
G.	9,3,6	4,0,11	0,2,3	4,2,4
H.	6,0,4	1,2,3	9,1,2	0,7,4

Estimation

. . . or "coming close" . . . with easier arithmetic.

585 ÷ 13 =

				(How close?)
+15	−3	→	600 ÷ 10 = _____	( )A.
+15	+2	→	600 ÷ 15 = _____	( )B.
−85	−3	→	500 ÷ 10 = _____	( )C.

Getting an exact result

13 ⟌ 585 D.

---

459 ÷ 27 =

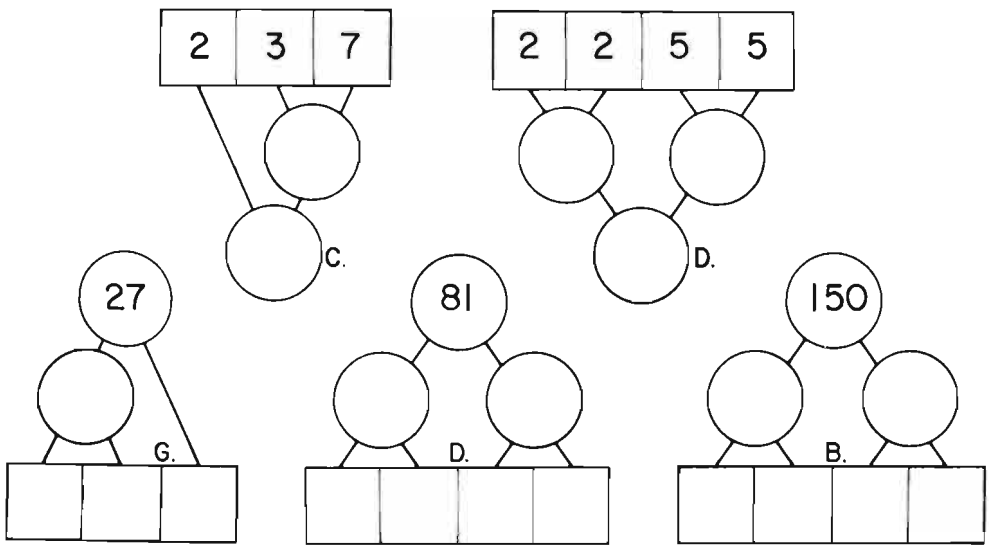
−9	+3	→	÷ = _____	( )A.
+41	+3	→	÷ = _____	( )B.
		→	450 ÷ 25 = _____	( )C.

27 ⟌ 459 D.

2025 ÷ 45 =

−25	−5	→	÷ = _____	( )C.
−25	+5	→	÷ = _____	( )B.
÷5	÷5	→	÷ = _____	( )A.

45 ⟌ 2025 D.



Factor Trees

(excluding 1 as a factor)

	A.	B.	C.	D.
E.	6	$-\frac{1}{3}$	+5	100
F.	+15	9	+1	17
G.	0	−5	3,3,3	3,3,3,3
H.	−2	2,5 5,3	42	45

Please indicate the largest amount with an A in the tinted block;
the next largest amount with a B, the next with a C, and the smallest with a D.

An hour and a half .....

Three quarters of an hour .....

Seventy minutes .....

An hour and a quarter .....

Please find the difference in minutes between:

A and B: _____ (a) min. A and C: _____ (d) min.
A and D: _____ (b) min. B and C: _____ (e) min.
B and D: _____ (c) min. C and D: _____ (a) min.

Two pounds, 10 ounces .....

Two and a half pounds .....

Two and ¾ pounds .....

Two ounces .....

Please find the difference in ounces between:

A and B: _____ (b) oz. A and C: _____ (e) oz.
A and D: _____ (c) oz. B and C: _____ (f) oz.
B and D: _____ (d) oz. C and D: _____ (j) oz.

Twenty inches .....

Two feet .....

One foot, 7 inches .....

Three fourth of a foot .....

Please find the difference in inches between:

A and B: _____ (e) in. A and C: _____ (e) in.
A and D: _____ (a) in. B and C: _____ (k) in.
B and D: _____ (b) in. C and D: _____ (c) in.

Seventeen dimes .....

Twenty-five nickels .....

Two and a half dollars .....

Two hundred pennies .....

Please find the difference in cents between:

A and B: _____ (a) ¢ A and C: _____ (d) ¢
A and D: _____ (b) ¢ B and C: _____ (c) ¢
B and D: _____ (c) ¢ C and D: _____ (b) ¢

amount shown	¢	a.
half as much	¢	b.
one third as much	¢	c.
one fourth as much	¢	d.
one sixth as much	¢	e.

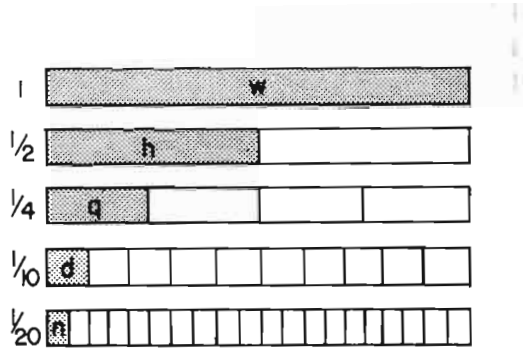
	a.	b.	c.	d.	e.
f.	25	36	75	18	2
g.	15	11	10	20	12
h.	72	125	30	1	4
i.	50	45	24	80	5
j.	38	2	42	40	4
k.	14	1	27	30	17

On Your Own (VI)

$$\begin{array}{r} 727 \\ \times \quad 9 \\ \hline \end{array}$$

$$\begin{array}{r} 148 \\ 148 \\ 148 \\ 148 \\ 148 \\ +\ 148 \\ \hline \end{array}$$

$$\begin{array}{r} 185 \\ \times \ 24 \\ \hline \\ \hline \end{array}$$



Please circle the letter after the line you think will be the best "estimate."

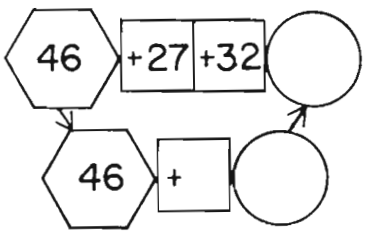
$575 \div 35$		$2511 \div 55$	
$500 \div 40$	A.	$3000 \div 50$	D.
$600 \div 40$	B.	$2000 \div 50$	E.
$600 \div 30$	C.	$2000 \div 60$	F.

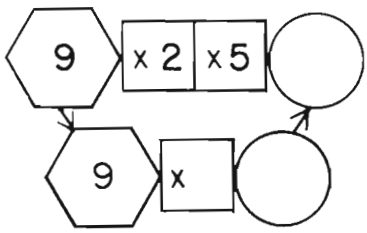
$$\begin{array}{r} 3h - 3q = \_\_\_\_ \\ - \quad\quad = \\ \hline \end{array}$$

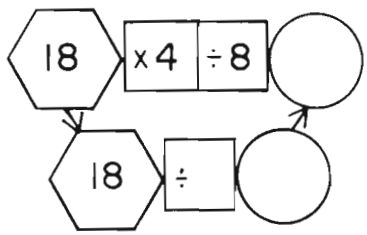
$$\begin{array}{r} 2w - 7d = \_\_\_\_ \\ - \quad\quad = \\ \hline \end{array}$$

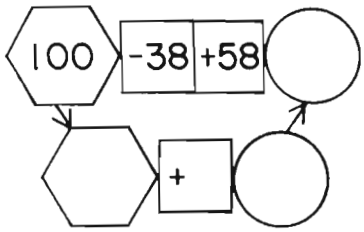
$$\begin{array}{r} 3h \div 15 = \_\_\_\_ \\ \div\ 15 = \\ \hline \end{array}$$

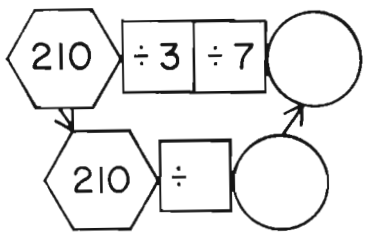
Chain Reactions . . . and Shortcuts

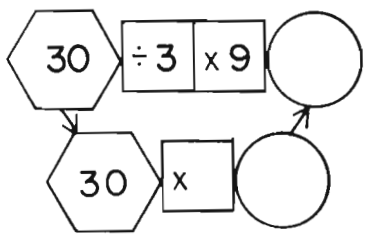




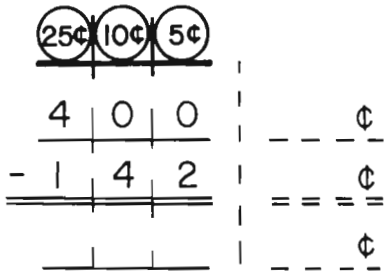


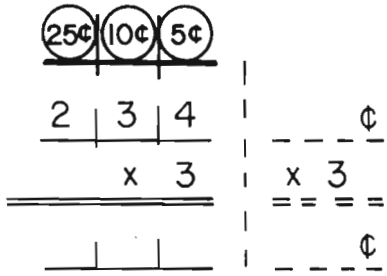






How do you feel?





If the results aren't interesting
then one of us goofed! . . . . . signed "GOOOOOFY"

7 × 3 A.	195 × 2 A.	63 × 2 A.	378 × 4 D.	108 × 9 D.	154 × 8
105 × 2 B.	130 × 3 E.	42 × 3 G.	243 × 4 E.	308 × 4	216 × 7 G.
42 × 5 E.	65 × 6 A.	18 × 7 A.	176 × 7	168 × 9 D.	162 × 6 D.
35 × 6 B.	78 × 5 E	14 × 9 G.			
15 × 14 E.	325 × 12 B.	36 × 35 B.			
75 × 28 C.	156 × 25 G.	225 × 56 C.			

54 × 28 G.	42 × 36 D.			
36 × 27 E.	18 × 54 D.			

	A.	B.	C.	D.
E.	390	210	6300	972
F.	21	1260	12600	135
G.	126	3900	2100	1512

Pairs of Single-Digit Whole Number Factors

Rule: if not alike, please write the larger factor above the smaller factor.

E.	A.	F.	B.	F.	C.	D.	E.
x 2 / 12	x / 81	x / 14	x / 72	x 2 / 16	x / 63	x 2 / 18	x / 54	x / 20	x / 48

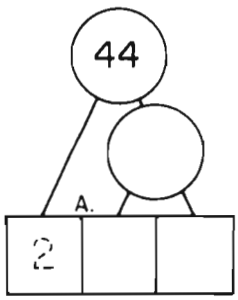
F.	G.	H.	I.	J.
x 3 / 24	x / 42	x / 25	x 6 / 36	x / 27	x / 32	x / 30	x / 28	x 4 / 36	x 4 / 24

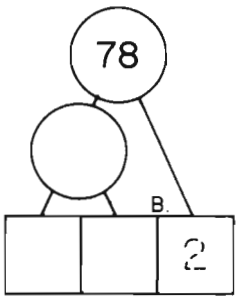
K.	A.	B.	C.	D.
x / 40	x / 21	x / 45	x 3 / 18	x / 49	x 4 / 16	x / 56	x / 15	x / 64	x 3 / 12

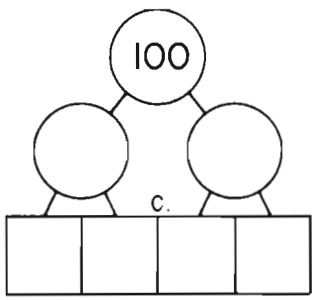
Taming frightfully big numbers . . .

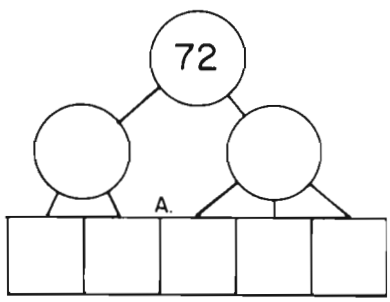
$\frac{1}{2} \times 100 =$ ____ A.	$2 \times 50 =$ ____	$1 \times 100 =$ ____
$\frac{1}{2} \times 400 =$ ____ B.	$2 \times 60 =$ ____	$10 \times 100 =$ ____ D.
$\frac{1}{2} \times 4000 =$ ____ C.	$2 \times 500 =$ ____ D.	$100 \times 100 =$ ____
$\frac{1}{2} \times 2000 =$ ____ D.	$2 \times 600 =$ ____	$10 \times 1000 =$ ____
$\frac{1}{2} \times 1000 =$ ____ E.	$8 \times 500 =$ ____	$100 \times 1000 =$ ____
$\frac{1}{2} \times 500 =$ ____ F.	$8 \times 600 =$ ____	$1000 \times 1000 =$ ____

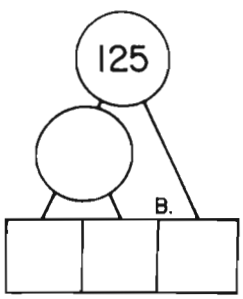
Factor Trees (excluding 1 as a factor)

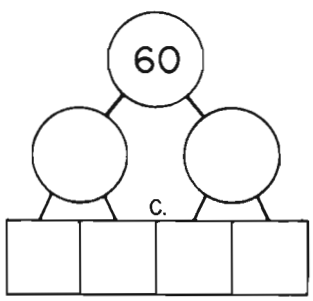






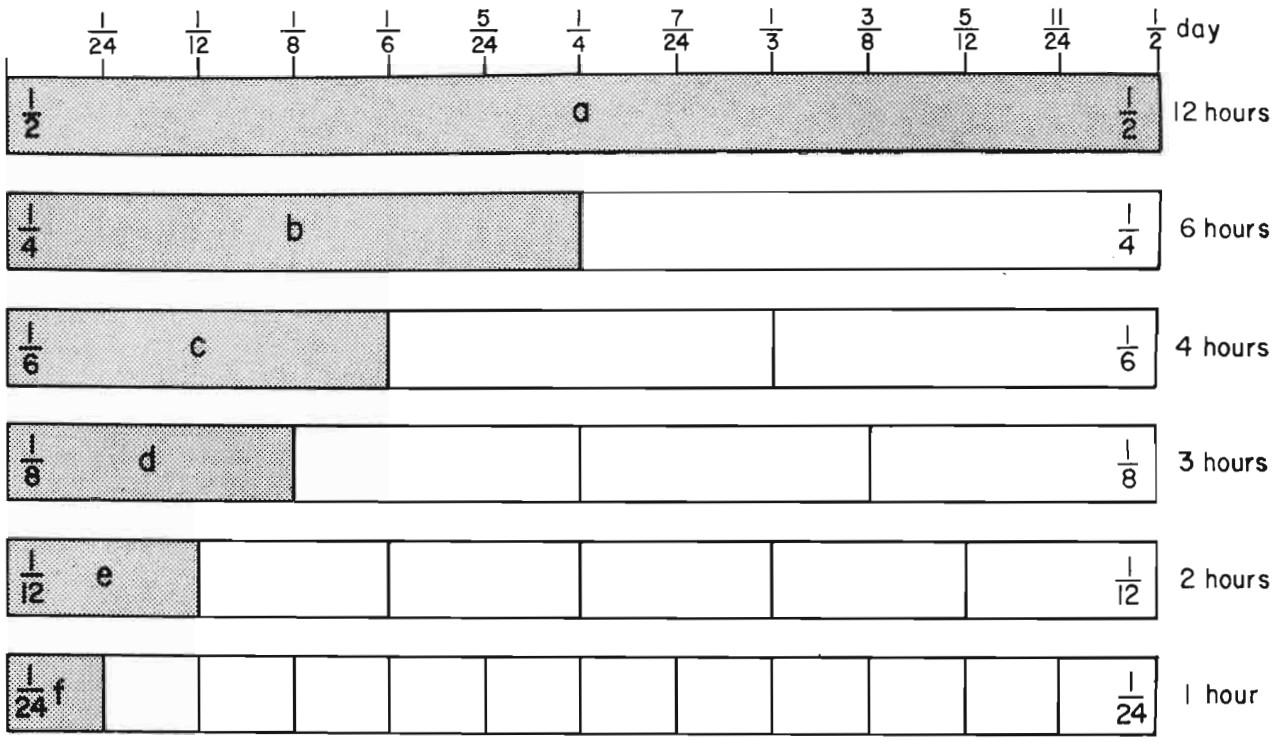






	A.	B.	C	D	E.	F.
G.	50	8,9	2,2,3,5	6,6	2,6	250
H.	2,2,11	7,7	2,000	6,9	4,8	2,7
I.	9,9	2,3,13	7,9	1,000	5,6	6,7
J.	2,2,2,3,3	200	2,2,5,5	8,8	500	4,9
K.	5,9	5,5,5	7,8	5,8	6,8	2,8

What Can You See?



$\frac{a - b}{\frac{1}{2} - \frac{1}{4}} = \underline{\quad}$ A.

$\frac{b - d}{\quad} = \underline{\quad}$ A. B. H.

$\frac{c - e}{\quad} = \underline{\quad}$ C. D. H.

$\frac{e - f}{\quad} = \underline{\quad}$ D. E. I.

$\frac{a - d}{\quad} = \underline{\quad}$ C. B. A.

$\frac{a - c}{\quad} = \underline{\quad}$ H. C. E.

$\frac{a \div 2}{\div 2} = \underline{\quad}$ H. A.

$\frac{a \times \frac{1}{2}}{\times \frac{1}{2}} = \underline{\quad}$ C. I.

$\frac{c \times \frac{1}{2}}{\times \frac{1}{2}} = \underline{\quad}$ G. D.

$\frac{a \times \frac{1}{3}}{\times \frac{1}{3}} = \underline{\quad}$ C. G.

$\frac{a \times \frac{2}{3}}{\times \frac{2}{3}} = \underline{\quad}$ H. E.

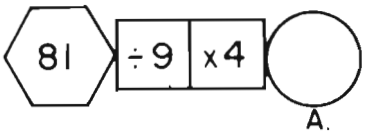
$\frac{b \times \frac{1}{6}}{\times \frac{1}{6}} = \underline{\quad}$ A. I.

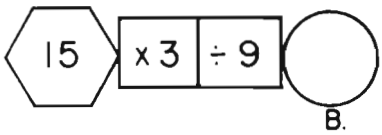
$\frac{b \times \frac{5}{6}}{\times \frac{5}{6}} = \underline{\quad}$ I. G.

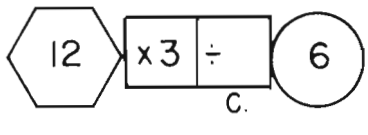
	A.	B.	C.	D.	E.	F.
G.	$\frac{3}{8}$	$\frac{1}{5}$	$\frac{1}{6}$	$\frac{3}{7}$	$\frac{3}{4}$	$\frac{5}{24}$
H.	$\frac{1}{9}$	$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{12}$	$\frac{1}{3}$	$\frac{5}{6}$
I.	$\frac{1}{4}$	$\frac{5}{12}$	$\frac{1}{24}$	$\frac{2}{3}$	$\frac{1}{24}$	$\frac{7}{12}$

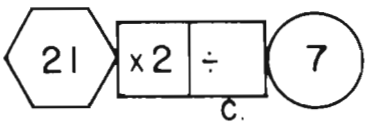
Two-Step and Four Step CHAIN REACTIONS

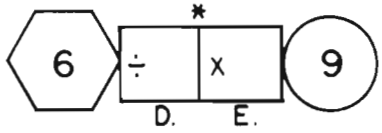
(note: *indicates several solutions)

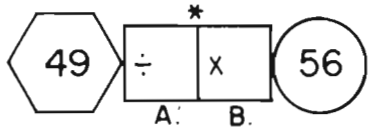


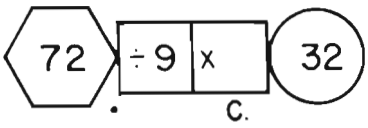


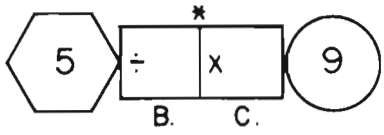


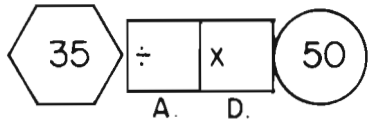


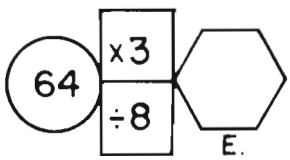


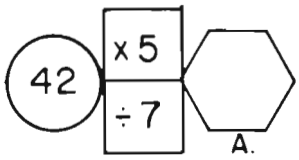


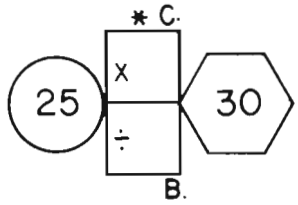


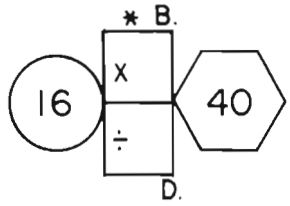


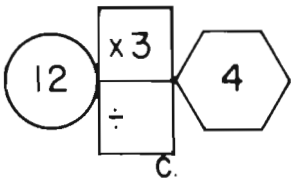


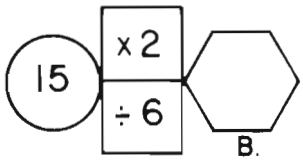


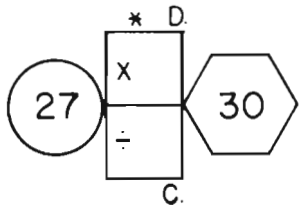


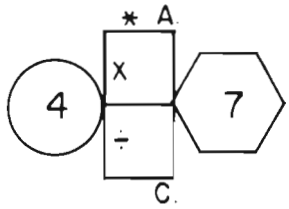


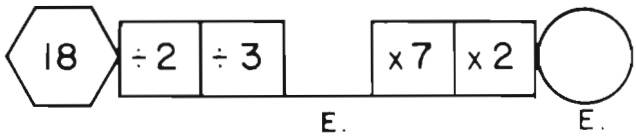


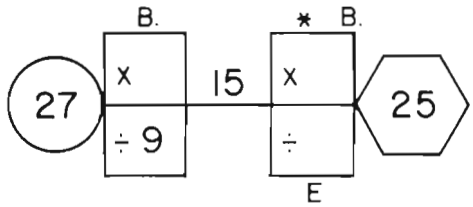


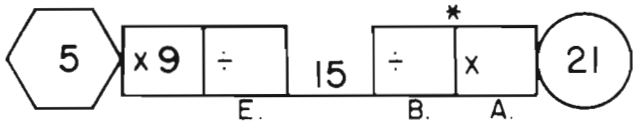


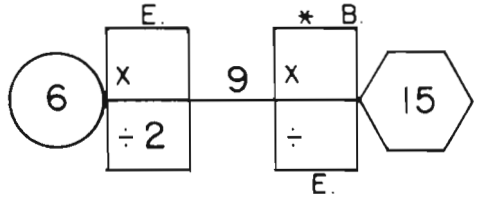


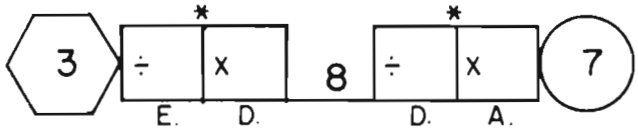


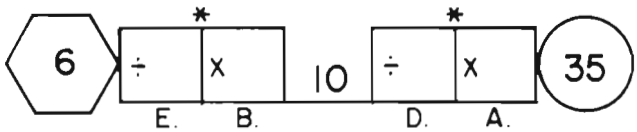












(If there is more than one solution, only the simplest is given.)

A.	B.	C.	D.	E.
7	11	4	2	42
30	5	6	8	24
36	8	9	10	3

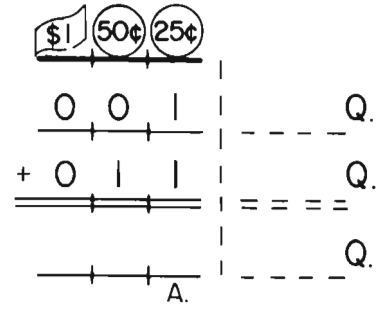
+, −, × and ÷ Measurements

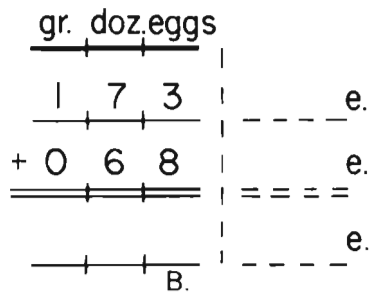
1 gross = 12 dozen

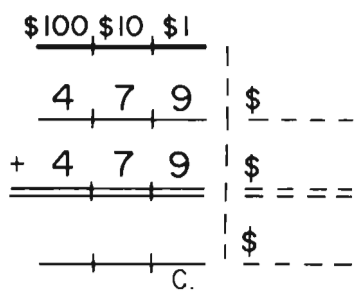
1 dollar = 2 half dollars

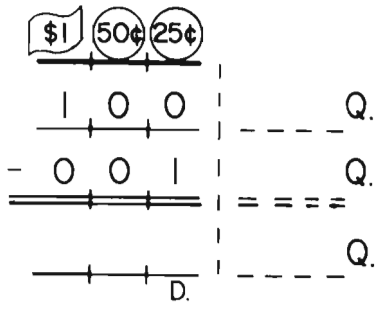
1 dozen = 12 eggs

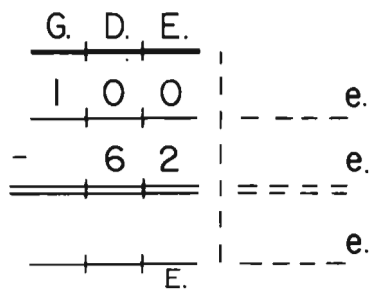
1 half dollar = 2 quarters

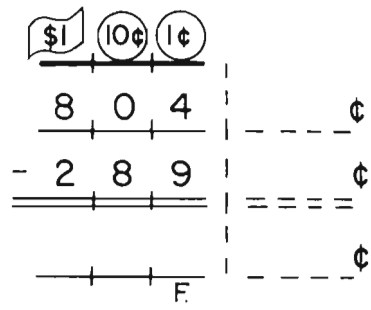


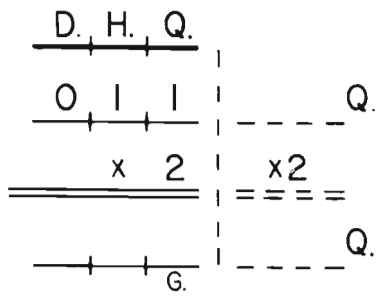


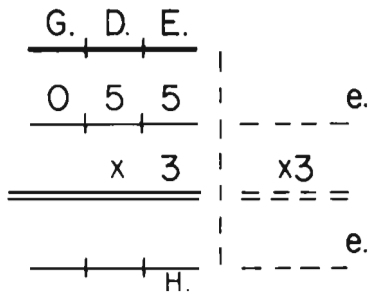


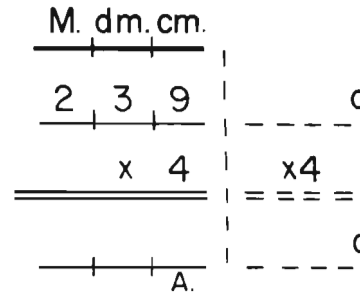


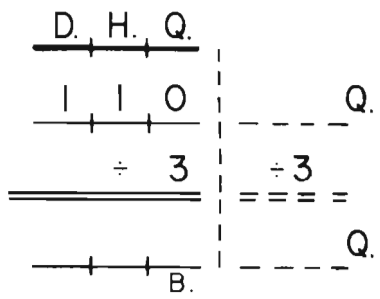


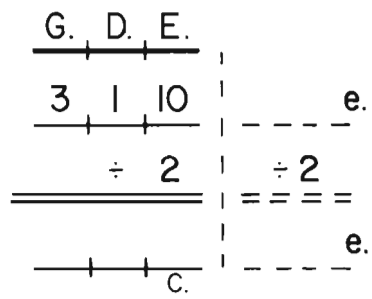


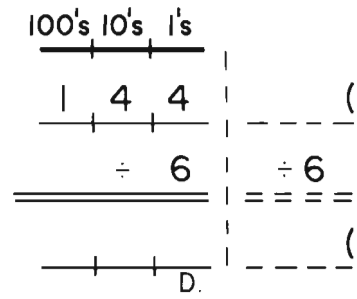


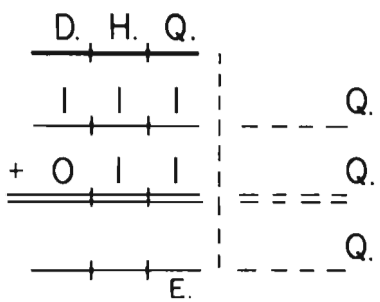


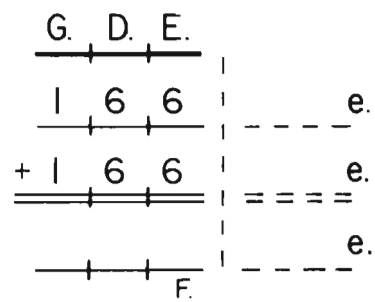












	A.	B.	C.	D.
E.	9,5,6	2,1,0	0,5,10	2,2,2
F.	3,1,0	2,1,11	1,6,11	5,1,5
G.	1,1,0	0,1,0	9,5,8	0,2,4
H.	1,0,0	1,4,3	3,4,5	0,1,1

Estimation

. . . or "coming close" . . . with easier arithmetic.

38 x 74 =

					(How close?)	Getting an exact result
+2	-4	→	___ x ___	= ___	( )A.	38 x74
+2	+1	→	___ x ___	= ___	( )B.	
+4	-4	→	___ x ___	= ___	( )C.	___ D.

49 x 83 =

+1	+1	→	___ x ___	= ___	( )A.	49 x83
-1	-2	→	___ x ___	= ___	( )	
+1	-3	→	___ x ___	= ___	( )C.	___ D.

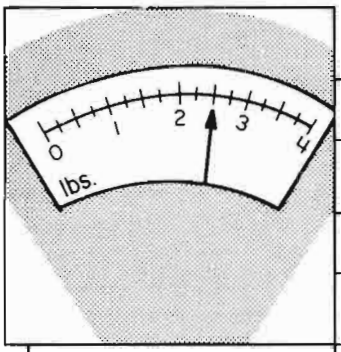
275 x 45 =

+25	+ 5	→	___ x ___	= ___	( )A.	275 x 45
-25	+ 5	→	___ x ___	= ___	( )B.	
+25	- 5	→	___ x ___	= ___	( )C.	___ D.

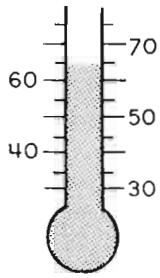
Taming frightfully big numbers . . .

2 x 75 = ___ A.	60,000 ÷ 2 = ___ B.	100 x 100 = ___ C.
4 x 75 = ___	60,000 ÷ 3 = ___	200 x 500 = ___ D.
40 x 75 = ___	60,000 ÷ 4 = ___	
4 x 750 = ___	60,000 ÷ 5 = ___	
40 x 750 = ___	60,000 ÷ 6 = ___	
20 x 750 = ___	60,000 ÷ 10 = ___	
10 x 750 = ___	60,000 ÷ 100 = ___	

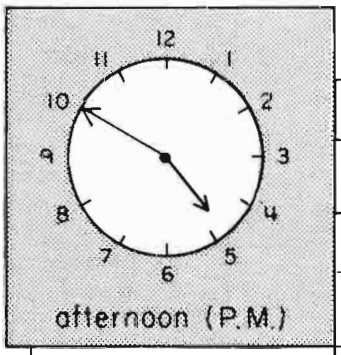
	A.	B.	C.	D.
E.	-12	+125	10,000	12,375
F.	150	+188	-375	2812
G.	+133	30,000	-67	100,000
H.	+2625	-17	+128	4067



weight shown	twice as much
_____ lb. A.	_____ lb. B.
half as much	¾ lb. more
_____ lb. C.	_____ lb. E.
¾ lb. less	three times as much
_____ lb. D.	_____ lb. F.

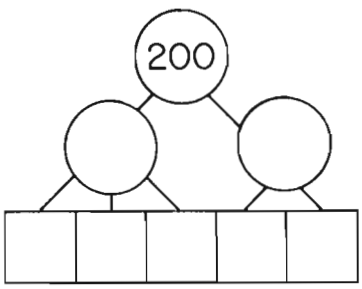


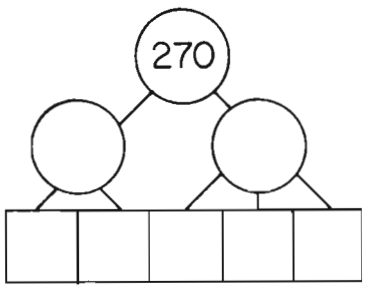
temperature shown	up 15°
° _____ A.	° _____ B.
down 25°	down 65°
° _____ C.	° _____ E.
up 17°	down 17°
° _____ D.	° _____ F.



time shown	6 hours earlier
_____ p.m. A.	_____ a.m. B.
1¼ hr. later	45 min. earlier
_____ A	_____ B.
50 min. earlier	⅓ hour later
_____ B.	_____ A.
12 hours later	24 hours later
_____ A.	_____ A.

amount shown	half as much
_____ ¢ C.	_____ ¢ D.
twice as much	¼ as much
_____ ¢ E.	_____ ¢ D.
3 times as much	49¢ more
_____ ¢ F.	_____ ¢ E.
19¢ less	½ dollar more
_____ ¢ C.	_____ ¢ F.





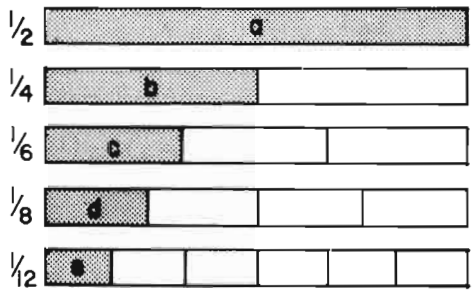
A.	B.	C.	D.	E.	F.
6:05	4:05	1¼	82	19	39
2½	10:50	28	7	0	7½
4:50	80	1	1¾	56	84
65	5	9	14	77	48
5:10	4:00	40	7	3¼	78

On Your Own (VII)

$$\begin{array}{r} 1000 \\ -\ 392 \\ \hline \end{array}$$

$$\begin{array}{r} 148{,}296 \\ 148{,}296 \\ +148{,}296 \\ \hline \end{array}$$

$$\begin{array}{r} 296 \\ \times\ 75 \\ \hline \end{array}$$



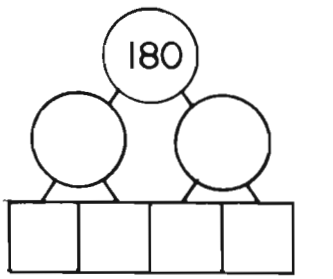
Please circle the letter after the line you think will be the best "estimate".

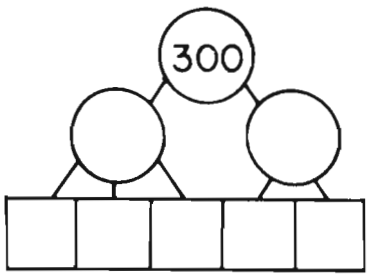
64 x 66	349 x 25
60 x 60 A.	350 x 30 D.
70 x 70 B.	300 x 20 E.
70 x 60 C.	400 x 20 F.

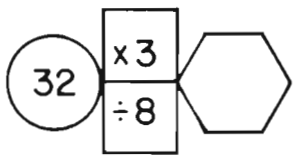
b - c = ____
\- =

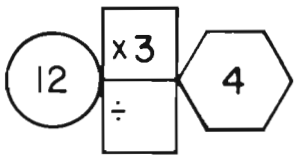
a - 2d = ____
\- =

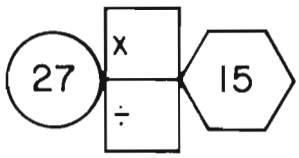
b x 1/2 = ____
x 1/2 =

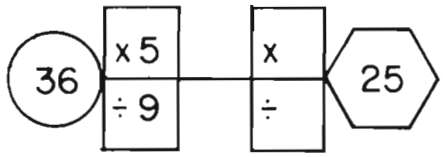


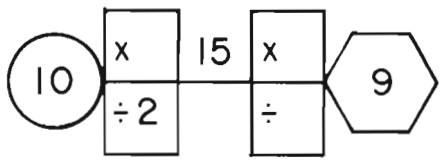


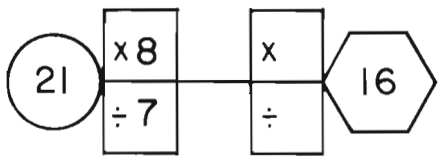












1 gross = 12 doz.

1 dozen = 12 eggs

gr.	doz.	eggs	
1	7	9	___ e.
+ 3	8	2	___ e.
			= = = =
			___ e.

How do you feel?

g.	d.	e.	
7	10	0	___ e.
	÷	3	
			= = = =
			___ e.

If the results aren't interesting
then one of us goofed! . . . . . signed "GOOOOOFY"

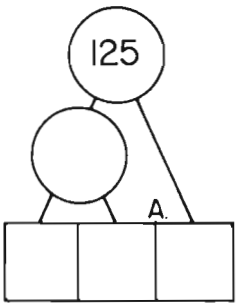
79 + 32	63 + 42 B.	37 × 3	4 × 3	401 −179 D.	74 × 3 H.
4 ⟌492 C.	37 × 9 A.	76 + 9 B.	7 × 8 D.	143 × 7 A.	4 ⟌52 B.
185 × 6 A.	4321 − 3087 B.	6 ⟌342 C.	74 × 9 D.	1738 × 4 A.	

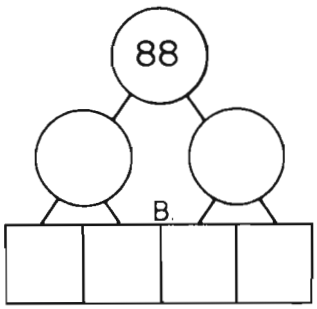
Peculiar Pairs

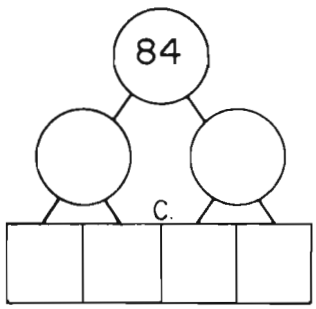
42 × 12 B. ——— 24 × 21 G.	39 × 31 C. ——— 93 × 13 F.	42 × 36 D. ——— 24 × 63 E.	918 − 275 C.	504 − 178 D.
			1026 − 437 A.	1503 − 624 C.

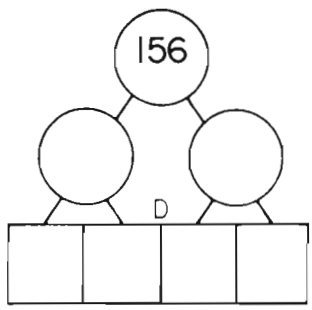
	A.	B.	C.	D.
E.	6952	13	643	1512
F.	589	105	1209	56
G.	333	504	57	326
H.	1001	1234	123	222
I.	1110	85	879	666

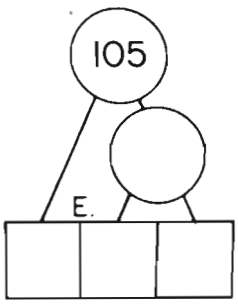
Factor Trees (excluding 1 as a factor) . . . You will need scratch paper.

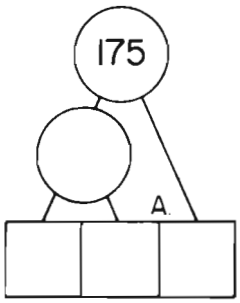


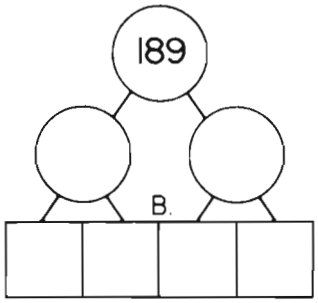


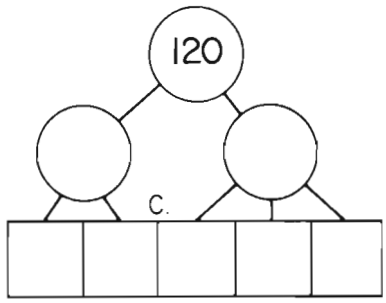


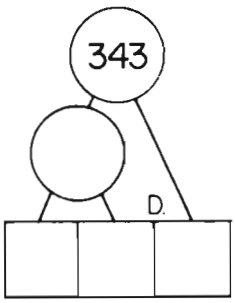


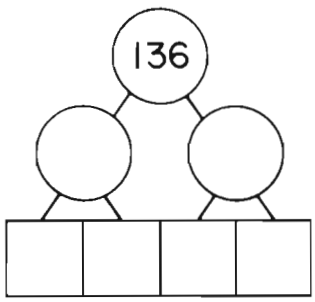


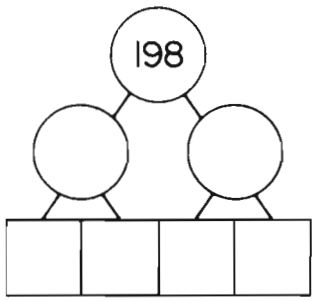


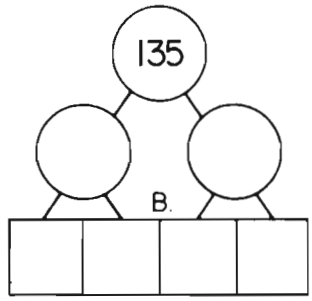


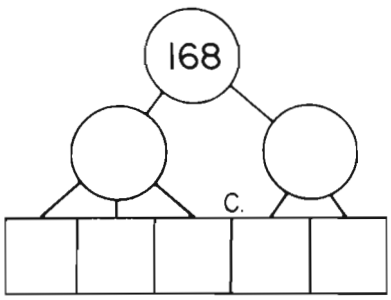


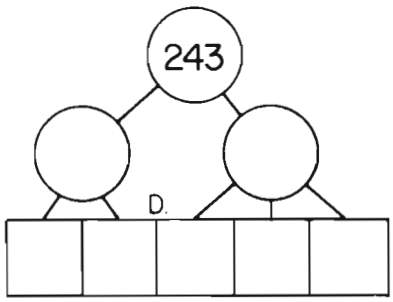


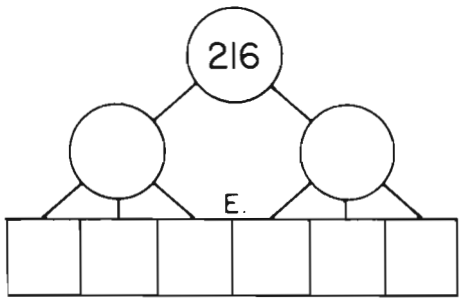


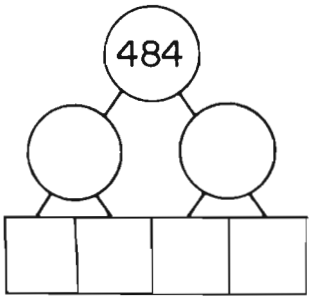


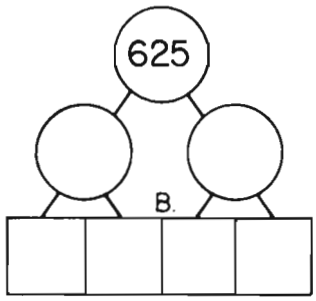






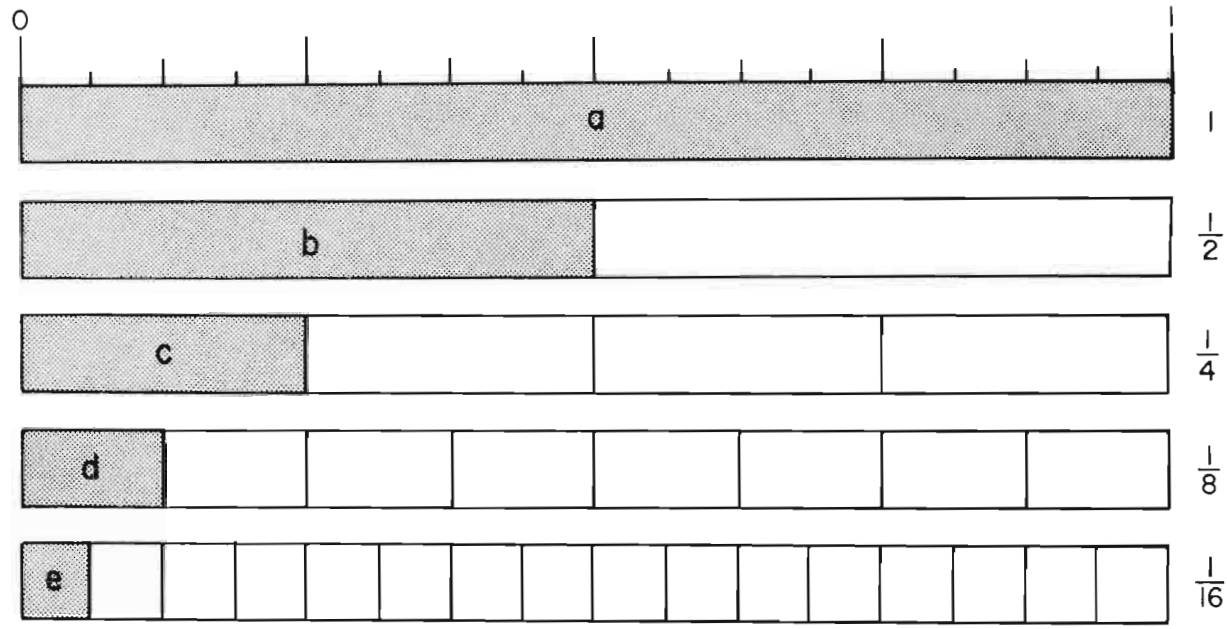






A.	B.	C.	D.	E.
5,5,7	5,5,5,5	2,2 2,3,7	2,2,3,13	7,11,13
2,2 11,11	3,3,3,5	2,2 2,3,5	5,5 5,5,5	3,5,7
5,5,5	3,3,3,7	2,2,3,7	3,3 3,3,3	2,2,5,7
2,3,3,11	2,2,2,11	7,7,7,7	7,7,7	2,2,2 3,3,3

What Can You See?



$\frac{1}{2} \times b = \frac{\quad}{\frac{1}{2} \times \text{A.}} = \text{B.}$

$\frac{1}{2} \times c = \frac{\quad}{\frac{1}{2} \times \text{B.}} = \text{C.}$

$\frac{1}{2} \times d = \frac{\quad}{\frac{1}{2} \times \text{C.}} = \text{D.}$

$\frac{1}{4} \times c = \frac{\quad}{\frac{1}{4} \times \text{I.}} = \text{H.}$

$\frac{1}{4} \times b = \frac{\quad}{\frac{1}{4} \times \text{H.}} = \text{G.}$

$\frac{1}{8} \times b = \frac{\quad}{\frac{1}{8} \times \text{A.}} = \text{D.}$

$\frac{1}{2} \times 3c = \frac{\quad}{\frac{1}{2} \times \text{B.}} = \text{A.}$

$\frac{1}{2} \times 3d = \frac{\quad}{\frac{1}{2} \times \text{A.}} = \text{C.}$

$\frac{1}{2} \times 5d = \frac{\quad}{\frac{1}{2} \times \text{D.}} = \text{G.}$

$\frac{3}{4} \times b = \frac{\quad}{\frac{3}{4} \times \text{A.}} = \text{I.}$

$\frac{3}{8} \times b = \frac{\quad}{\frac{3}{8} \times \text{H.}} = \text{C.}$

$\frac{5}{8} \times b = \frac{\quad}{\frac{5}{8} \times \text{H.}} = \text{E.}$

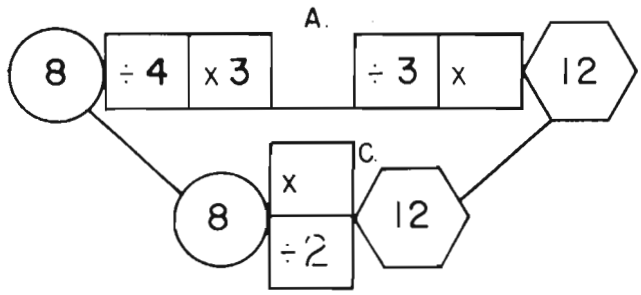
$\frac{3}{4} \times c = \frac{\quad}{\frac{3}{4} \times \text{B.}} = \text{C.}$

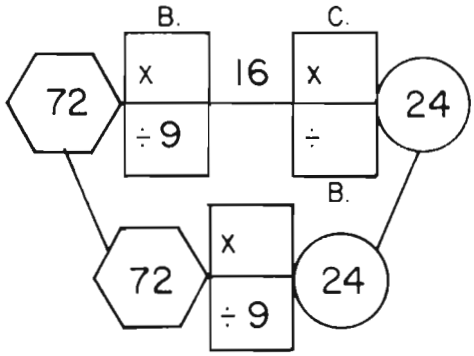
$\frac{1}{2} \times 7d = \frac{\quad}{\frac{1}{2} \times \text{E.}} = \text{F.}$

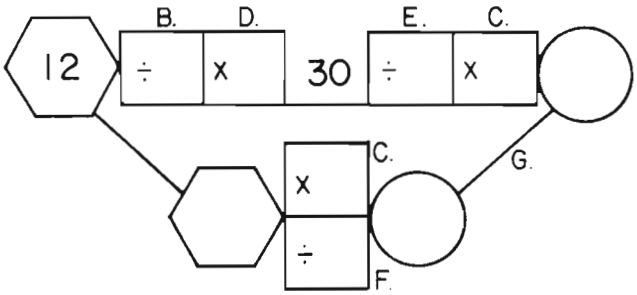
$\frac{1}{4} \times 3c = \frac{\quad}{\frac{1}{4} \times \text{B.}} = \text{C.}$

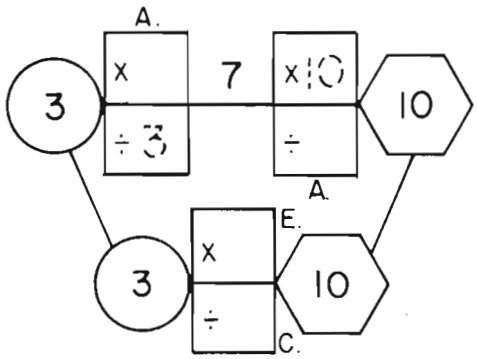
$\frac{3}{4} \times 3c = \frac{\quad}{\frac{3}{4} \times \text{B.}} = \text{F.}$

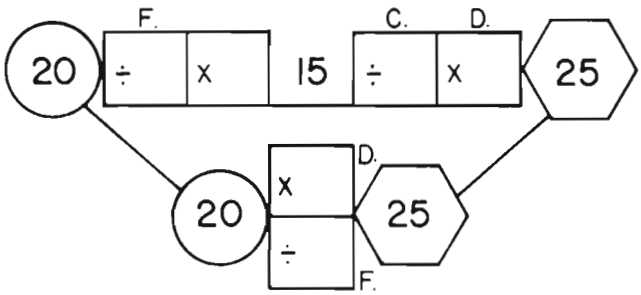
	A.	B.	C.	D.	E.	F.
G.	$\frac{1}{3}$	$\frac{1}{5}$	$\frac{1}{8}$	$\frac{5}{8}$	$\frac{5}{16}$	$\frac{11}{13}$
H.	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{16}$	$\frac{1}{16}$	$\frac{13}{16}$	$\frac{7}{16}$
I.	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{15}{16}$	$\frac{7}{10}$	$\frac{7}{8}$	$\frac{9}{16}$

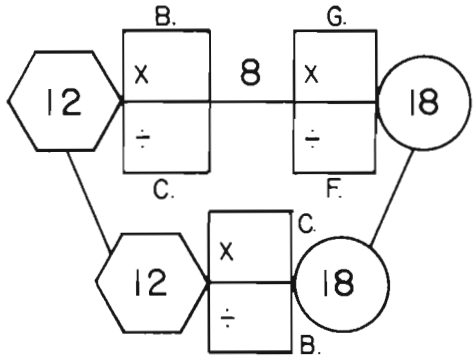


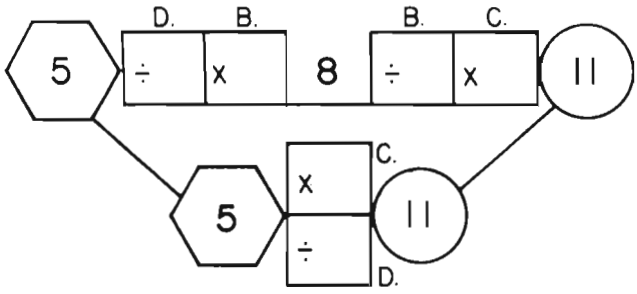


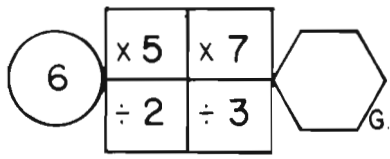


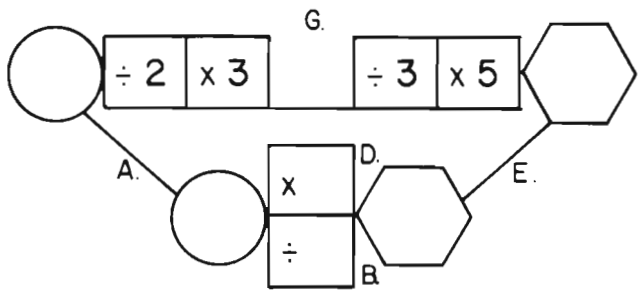












A.	B.	C.	D.	E.	F.	G.
6	12	11	14	10	16	15
1	2	13	5	17	4	35
7	8	3	18	15	20	9

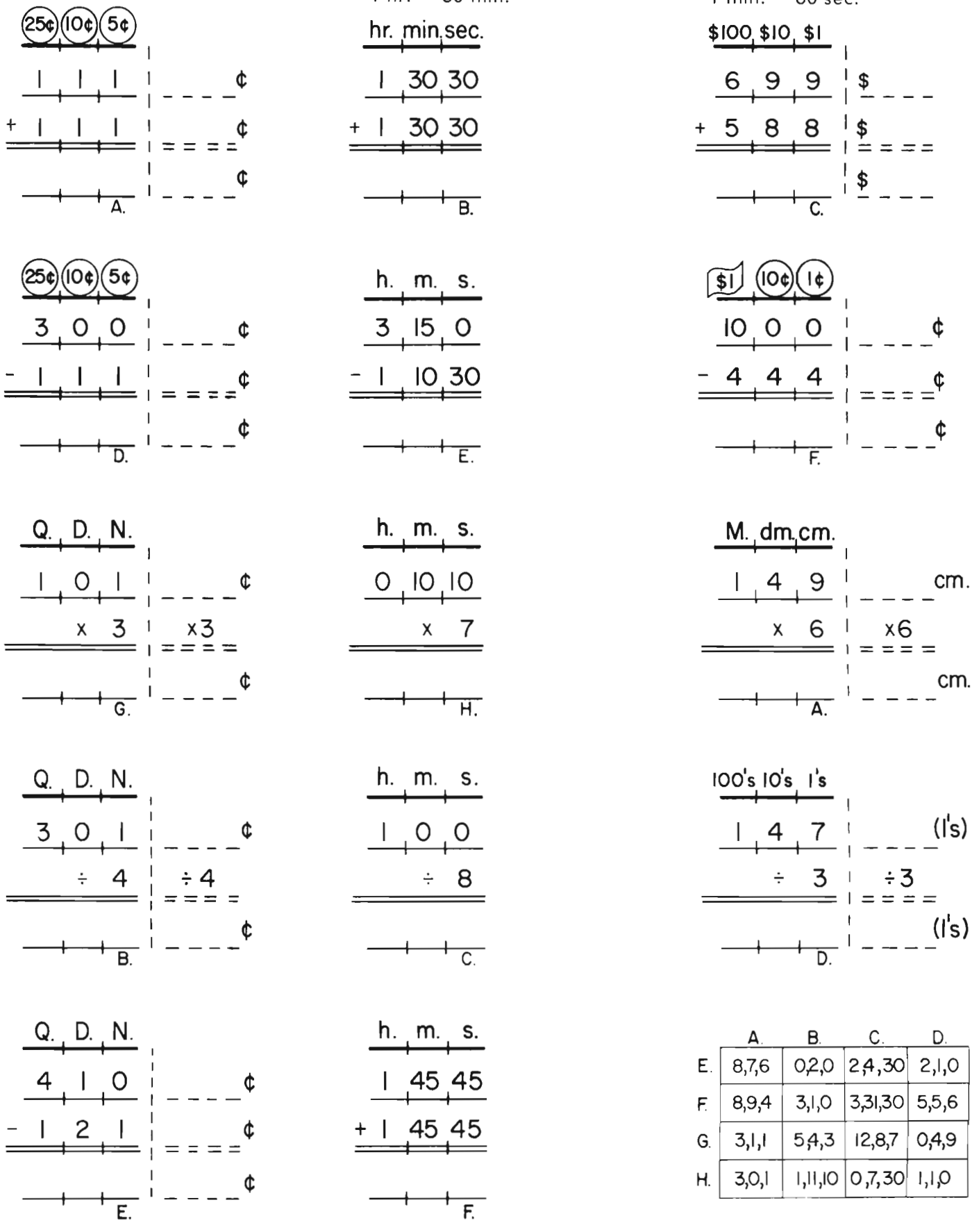
+, −, × and ÷ Measurements

1 quarter = 5 nickels

1 hr. = 60 min.

1 dime = 2 nickels

1 min. = 60 sec.



	A.	B.	C.	D.
E.	8,7,6	0,2,0	2,4,30	2,1,0
F.	8,9,4	3,1,0	3,31,30	5,5,6
G.	3,1,1	5,4,3	12,8,7	0,4,9
H.	3,0,1	1,11,10	0,7,30	1,1,0

Estimation

. . . or "coming close" . . . with easier arithmetic.

2279 ÷ 53 =

					(How close?)
-279	-3	→	÷ =		( )E.
-79	-3	→	÷ =		( )F.
+21	-3	→	÷ =		( )G.

Getting an exact result

$53\overline{)2279}$

5005 ÷ 35 =

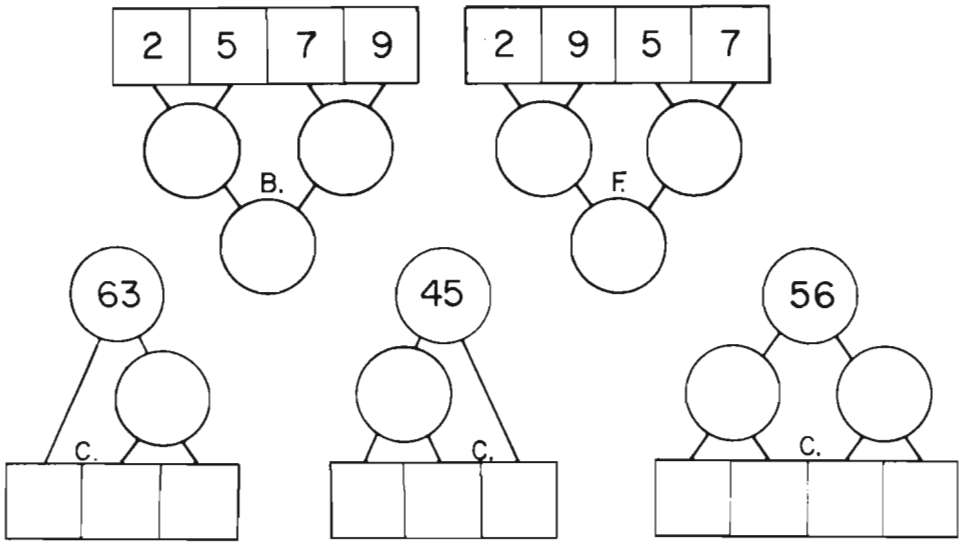
		→	4000 ÷ 40 =		( )E.
		→	6000 ÷ 30 =		( )F.
		→	4500 ÷ 30 =		( )G.

$35\overline{)5005}$

9,265 ÷ 85 =

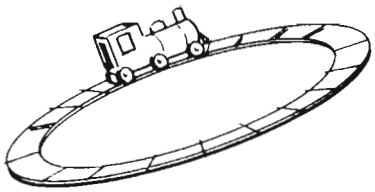
+735	+15	→	÷ =		( )D.
+635	+5	→	÷ =		( )F.
-265	+5	→	÷ =		( )E.

$85\overline{)9,265}$



Factor Trees
(excluding 1 as a factor)

	A.	B.	C.	D.
E.	-43	-3	3,3,7	-9
F.	+57	630	2,3,5,11	+1
G.	+18	+3	3,3,5	+7
H	-19	+14	2,2,2,7	-17



Lou found it took his model train 5 seconds to go around a circular track. He measured the track as 8 feet around. He wondered how many miles per hour the train was going.

Lou made a table like this: (Please fill in the missing entries.)

time	5 sec.	10 sec.	15 sec.	20 sec.	40 sec.	60 sec.
distance	8 ft.	ft.	ft.	ft.	ft.	ft.

60 seconds = 1 minute

time	1 min.	2 min.	20 min.	40 min.	60 min.
distance	ft.	ft.	ft.	ft.	ft.

There are 5,280 feet in one mile. How do you think Lou answers his question: How many miles per hour was his train travelling? "about _____ m.p.h."

Please make up your own problem of a similar kind.

Marie found she rode _____ ft. on her bicycle in _____ second. About how many miles per hour was she riding.

The blanks below may help you solve your problem.

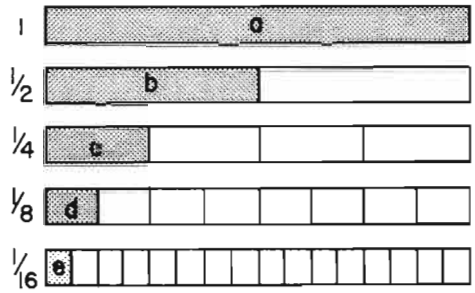
time	sec.				
distance	ft.				

time					
distance					

$$\begin{array}{r} 1738 \\ \times \quad 4 \\ \hline \end{array}$$

$$\begin{array}{r} 1305 \\ -\ 879 \\ \hline \end{array}$$

$$35\overline{)5110}$$



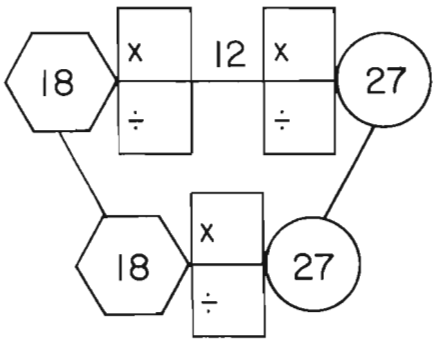
Please circle the letter after the line you think will be the best "estimate".

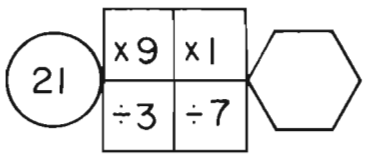
4500 ÷ 66	8513 ÷ 125
4200 ÷ 70 A.	8500 ÷ 100 D.
4200 ÷ 60 B.	9000 ÷ 100 E.
4800 ÷ 60 C.	8000 ÷ 100 F.

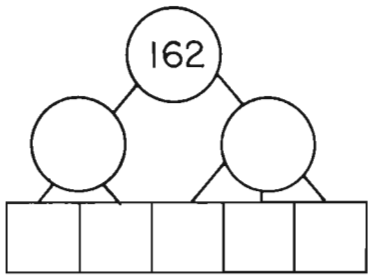
1/4 x b = _____
=

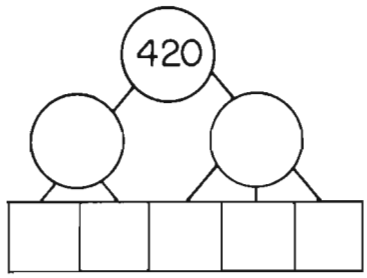
3/4 x c = _____
=

1/2 x 5d = _____
=









100 %	10 %	5 %	110 %	205 %
$ 10.00	$	$	$	$
$ 5.00	$	$	$	$
$ 15.00	$	$	$	$

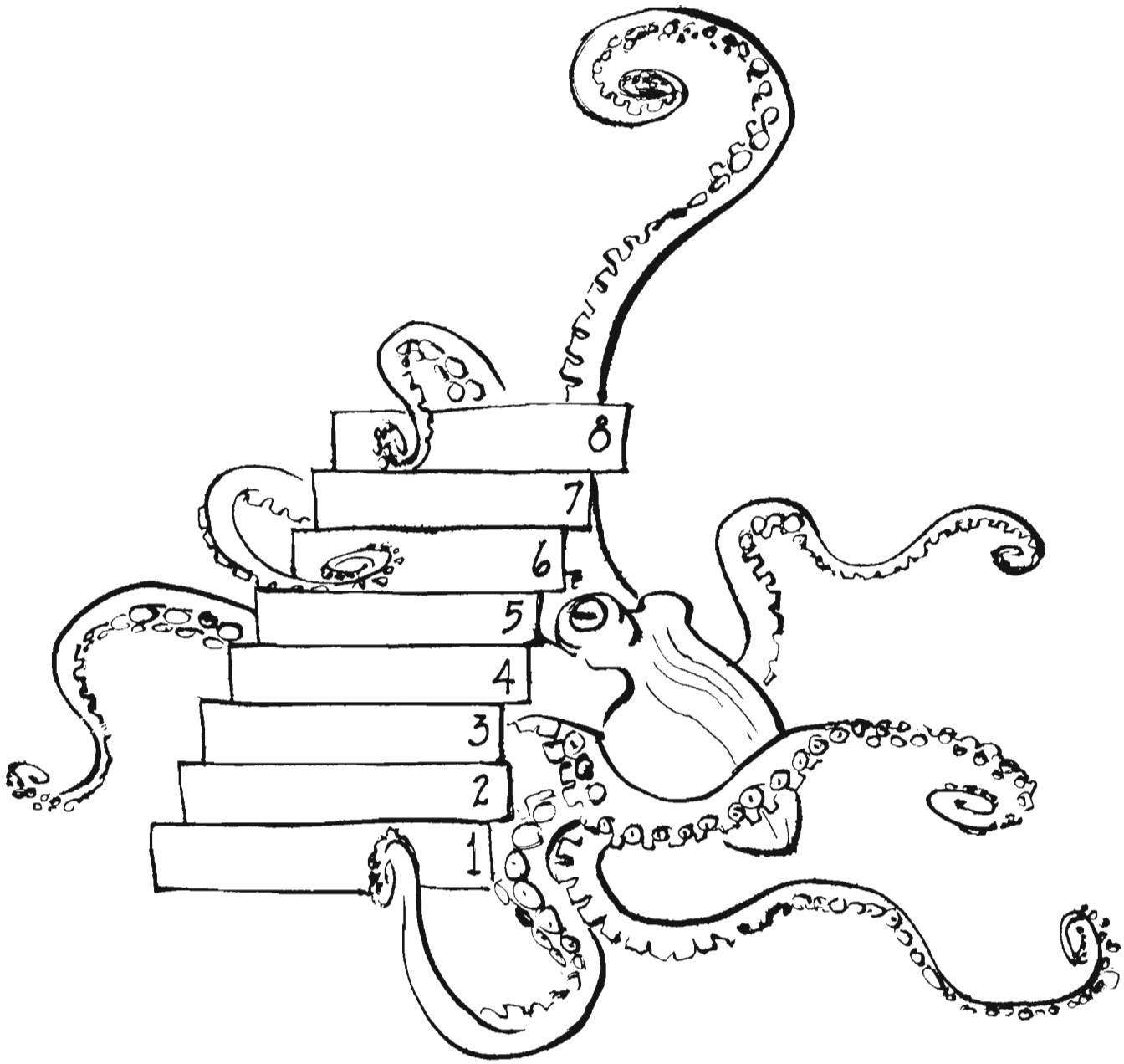
1 hour = 60 minutes

h.	m.	s.
1	30	45
+ 1	30	15

1 minute = 60 seconds

h.	m.	s.
1	0	0
−	9	48

How do you feel?


8
7
6
5
4
3
2
1

this book belongs to _____

este libro es de