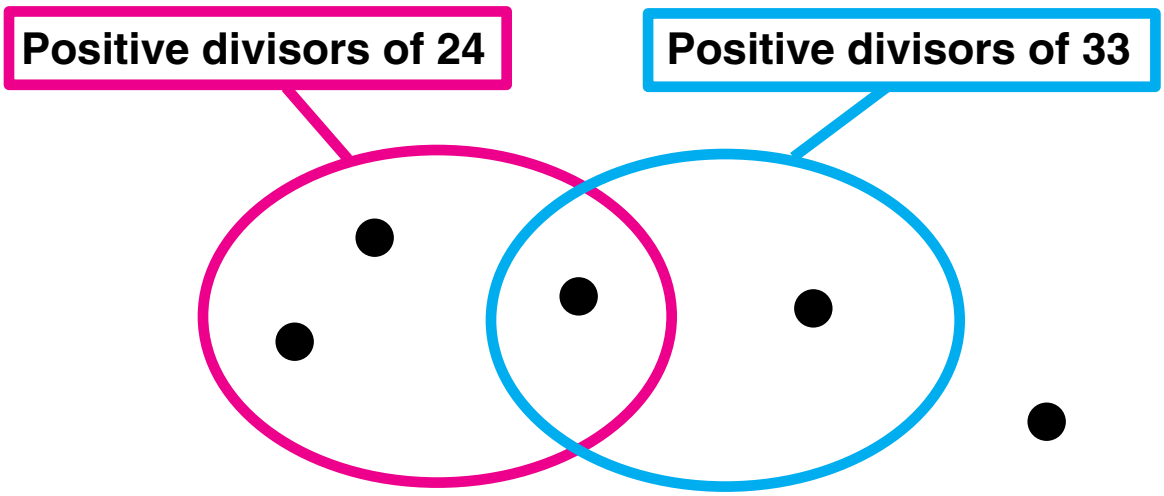
Name _____

Arcade of Problems #4

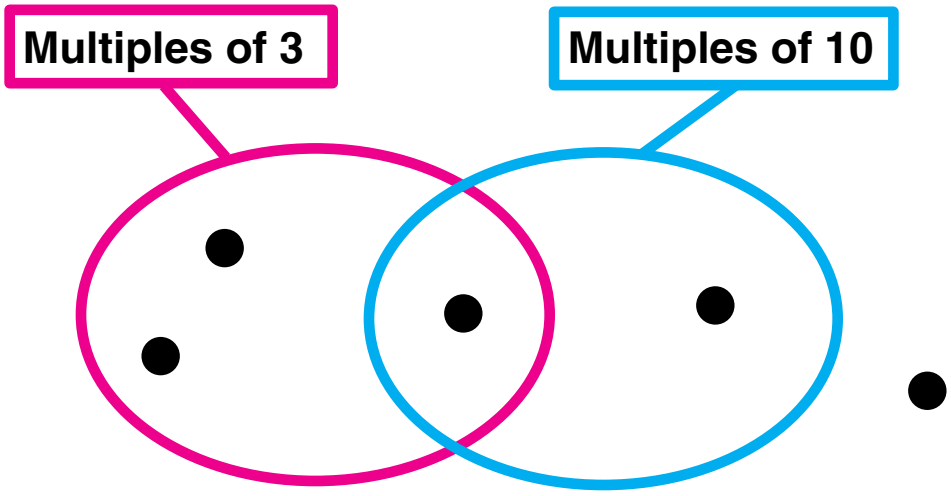
Put each of these numbers in the string picture.

3 7 8 11 12



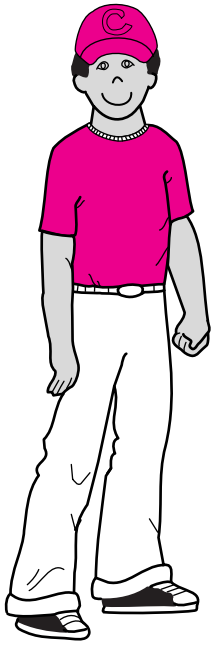
Put each of these numbers in the string picture.

12 18 20 25 30



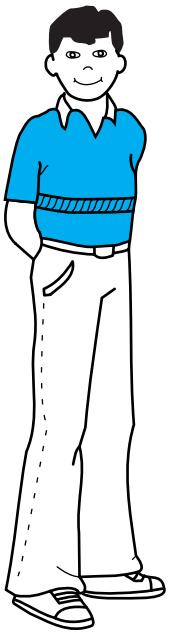
Build an arrow road from 36 to 100. Each arrow must be for one of these relations.

+4 +6 −4 −6 ×4 ×6 ÷4 ÷6



Joshua

Stephanie



Sam

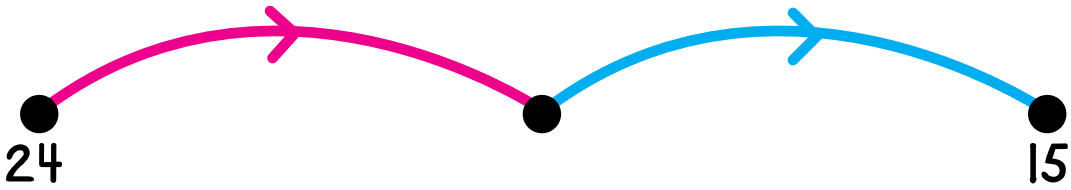
Joshua can jump twice as far as Stephanie.
Stephanie can jump three times as far as Sam.

They all jump from the same starting place along a chalk line down the middle of the sidewalk.

Starting place

Use a ruler to show where they might land on their first jumps. Draw dots the same color as their shirts. There are many correct answers, but measure carefully.

Pair the tags.



$\frac{1}{2}\times$	$\frac{1}{2}\times$
$\frac{1}{3}\times$	$\frac{1}{3}\times$
$\frac{2}{3}\times$	$+7$
$+6$	-1
-19	$+3$
$+21$	$3\times$

Put a one-digit number in each box to make the calculations correct.

$$\begin{array}{r} \square\,0\;9.3 \\ \square\,7.4 \\ +\;7\;2\;5.\square \\ \hline 1\;4\;9\square.2 \end{array}$$

$$\begin{array}{r} \square\,8.0 \\ -\;2\square.6 \\ \hline 5\;3.\square \end{array}$$

Add.

$2\frac{1}{4} + 5\frac{3}{4} + \frac{1}{2}$

Subtract.

$637.07 - 83.8$

Draw two circles of the same radius that intersect at two places.

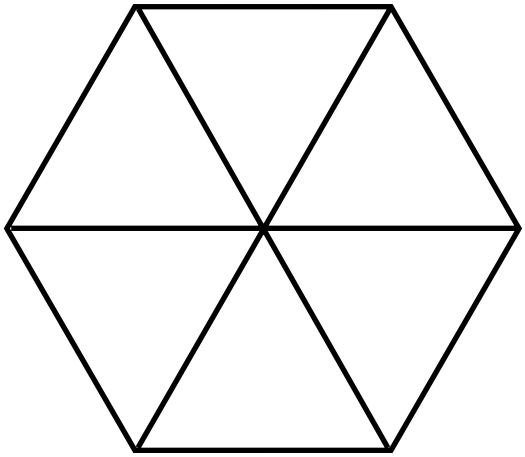
1. Draw dots at their centers.

2. Draw dots at their intersecting points.

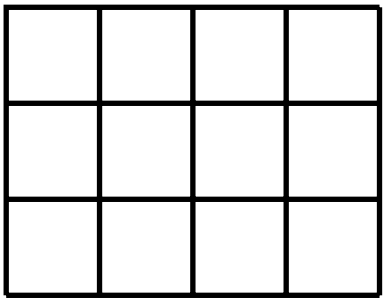
3. Connect every dot to every other dot.

4. Can you find four line segments that have the same length? _____
   Color them blue.

Color four-sixths of each shape red.



$\frac{4}{6}$



$\frac{4}{6}$

Put a whole number in each box.

$\frac{4}{6} = \frac{\square}{3}$

$\frac{4}{6} = \frac{\square}{12}$

$\frac{4}{6} = \frac{\square}{30}$

$\frac{4}{6} = \frac{\square}{24}$

$\frac{4}{6} = \frac{12}{\square}$

$\frac{4}{6} = \frac{400}{\square}$

All of the numbers had decimal points, but the eraser gremlin erased a decimal point from one number in each equation. Please put them back.

$$2\ 3 \times 4.6 = 10.58$$

$$4.82 + 39.6 = 4\ 4\ 4\ 2$$

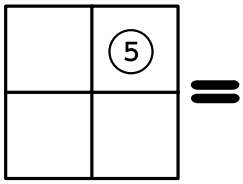
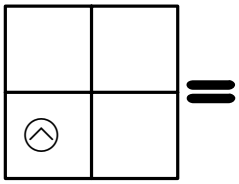
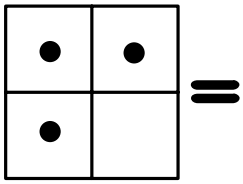
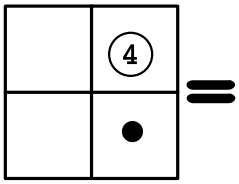
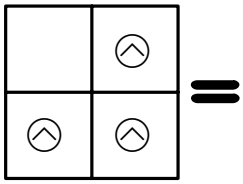
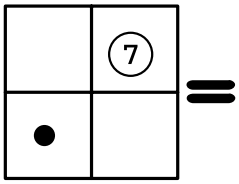
$$59.7 - 4\ 9\ 8\ 1 = 9.89$$

$$0.3 \times 98.7 = 2\ 9\ 6\ 1$$

$$1\ 2 - 0.8 = 0.4$$

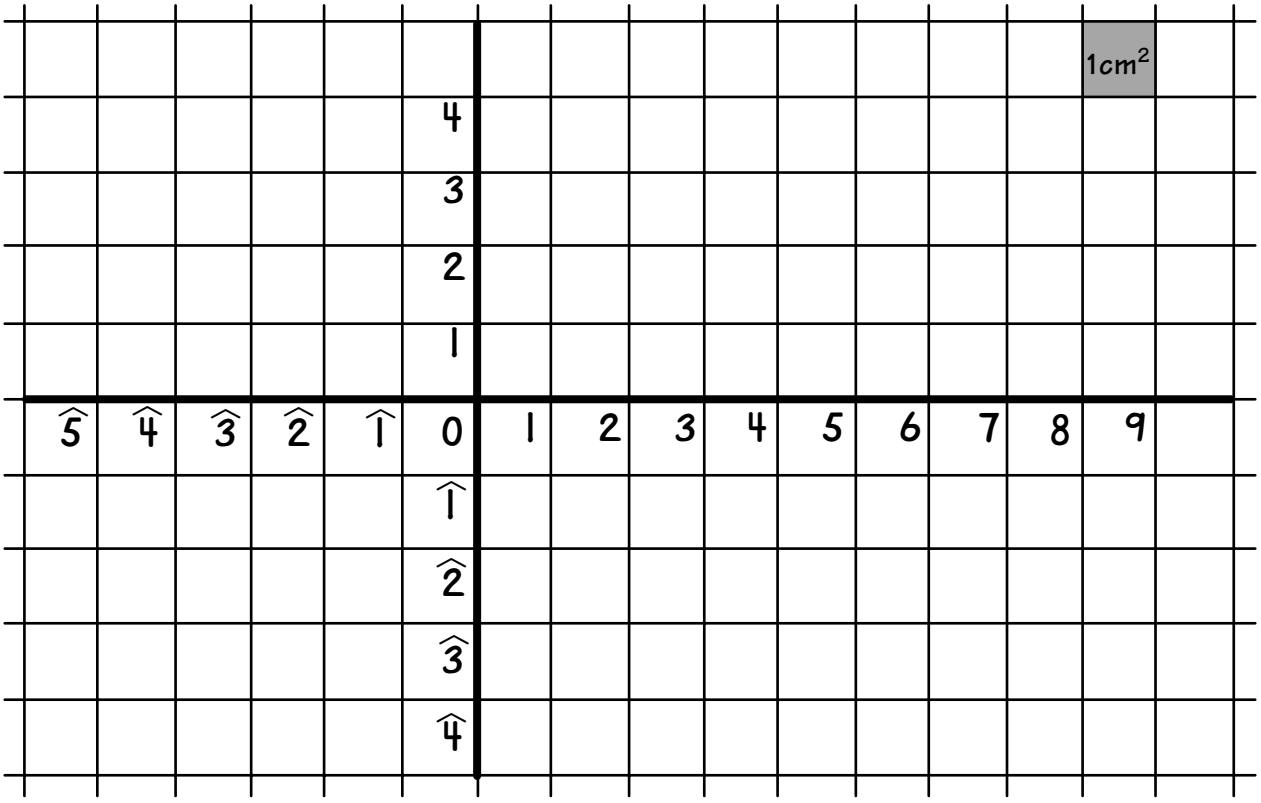
Put each type of number on the ones board of the Minicomputer by adding exactly one of these checkers.


Many solutions are possible.

An odd number 	A positive divisor of 30 
A multiple of 10 	A multiple of 5 
A positive prime number 	A number greater than 40 

Draw a triangle that

- has corners on grid points, and
- has an area of 4 cm^2 (each small grid square is 1 cm^2).



What are the ordered pairs at the three corners of the triangle you drew? (,) (,) (,)

If you double the area of the triangle, you get 8 cm^2. Enclose your triangle in a shape that has area 8 cm^2.

What are the ordered pairs at the corners of this shape?

_____

Kelsey and Eden work on a job together, but Kelsey does less work than Eden. They agree to share their earnings as follows:

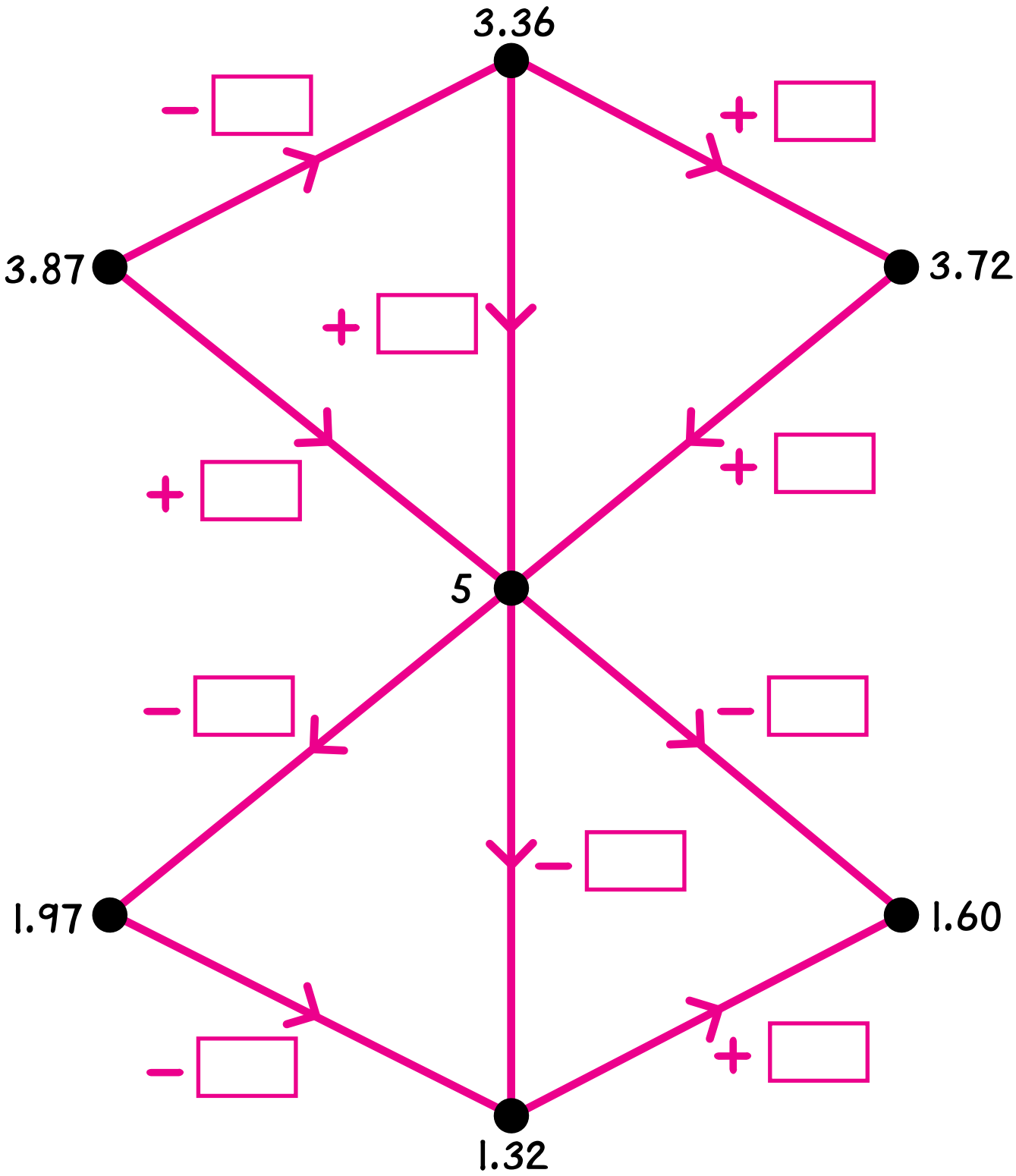
Kelsey gets $3 whenever Eden gets $5.

When Kelsey gets $24, how much does Eden get?_____

When Eden gets $25, how much does Kelsey get?_____

Suppose the total payment for the job is $200.
How much does Kelsey get?_____
How much does Eden get?_____

Fill in the boxes for the arrows.



Multiply.

$$\begin{array}{r} 938 \\ \times\ 6 \\ \hline \end{array} \qquad \begin{array}{r} 938 \\ \times 70 \\ \hline \end{array} \qquad \begin{array}{r} 938 \\ \times 76 \\ \hline \end{array}$$

$$\begin{array}{r} 938 \\ \times\ 0.6 \\ \hline \end{array} \qquad \begin{array}{r} 938 \\ \times 70.6 \\ \hline \end{array}$$

Divide.

$15\overline{)6375}$

$6375 \div 15 =$ ☐

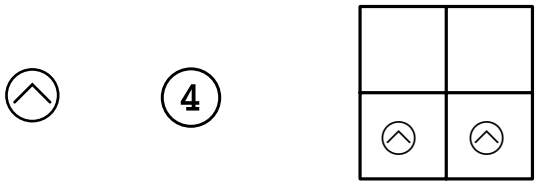
$637.5 \div 15 =$ ☐

$63.75 \div 15 =$ ☐

Gat is a secret number.

Clue 1

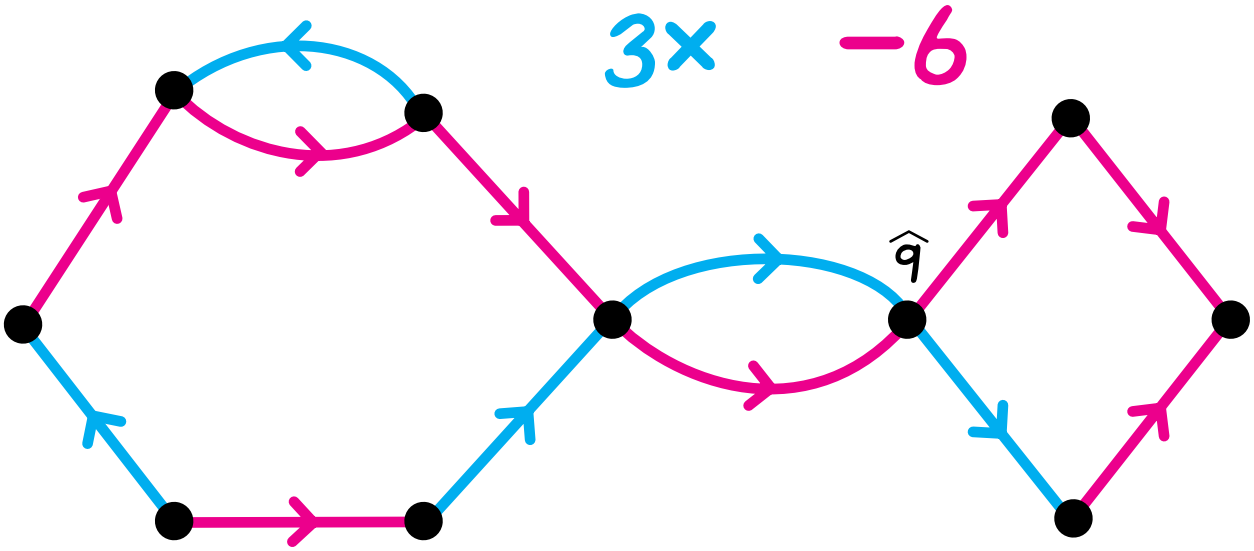
Gat can be put on this Minicomputer by adding exactly one of these checkers.



Gat could be _____, _____, _____, _____, _____, _____, _____, or _____.

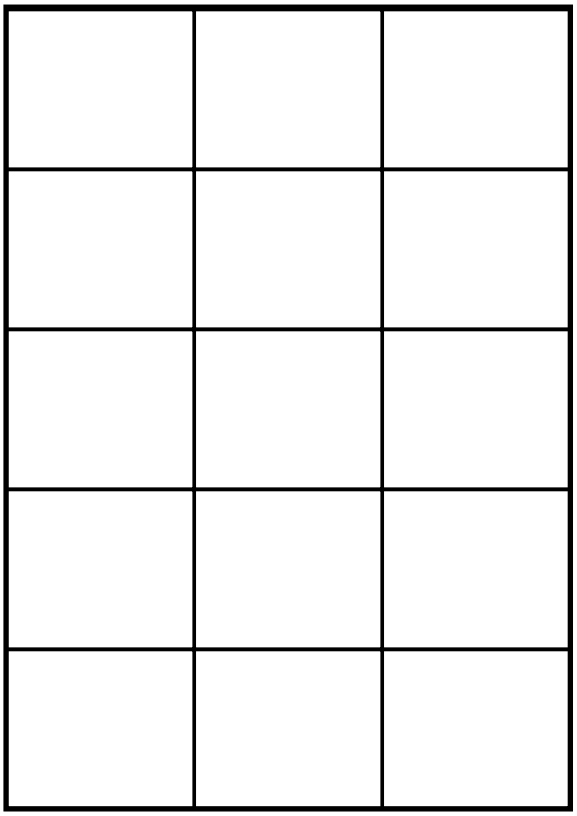
Clue 2

Gat is in this arrow picture.



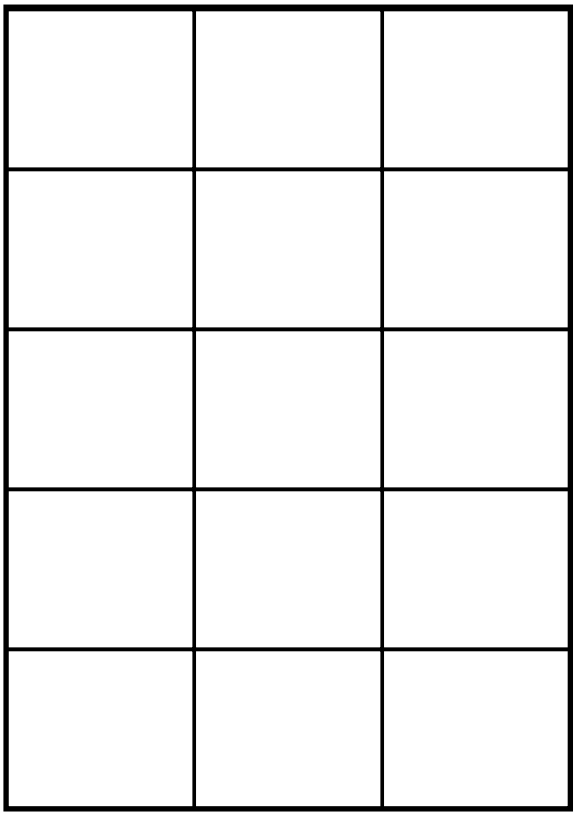
Who is Gat? _____

Color one-fifth of this region red and fill in the box.



$\frac{1}{5} = \frac{\square}{15}$

Color two-thirds of this region red and fill in the box.

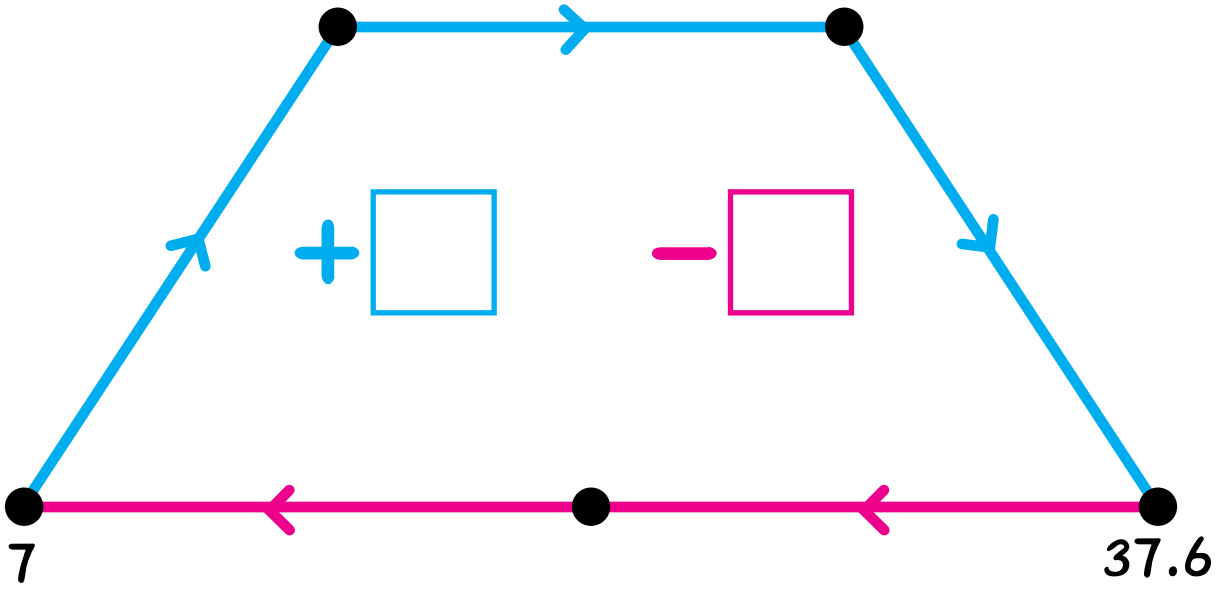


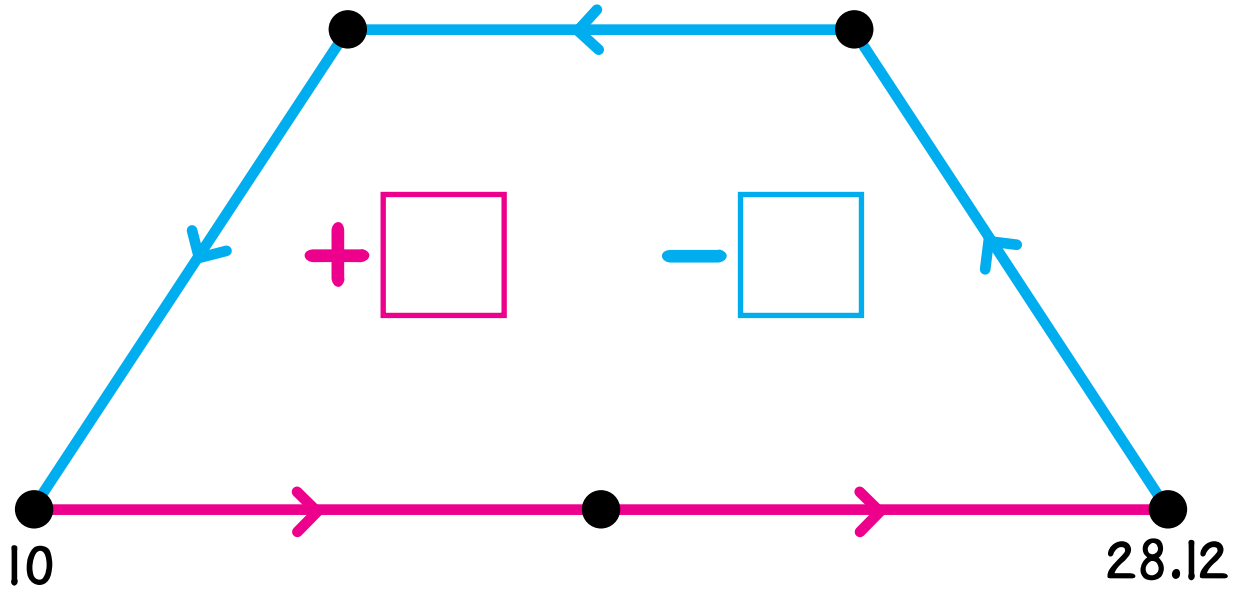
$\frac{2}{3} = \frac{\square}{15}$

Complete.

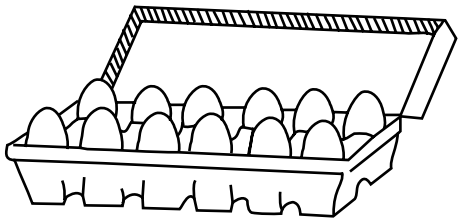
$$\frac{1}{5} + \frac{2}{3} = \frac{\square}{15} + \frac{\square}{15} = \underline{\qquad\qquad}$$

Fill in the boxes for the arrows and label the dots.

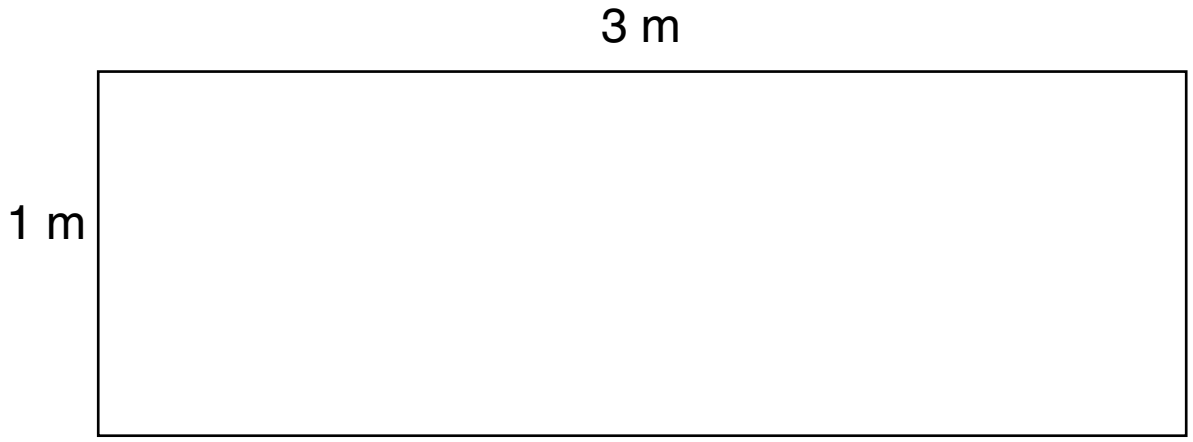




Mrs. Oleson buys eggs for 5¢ apiece and sells them for 84¢ a dozen. What is her profit on 14 dozen eggs? _____
Show your work.



Elizabeth buys 3 meters of a fabric with width 1 meter. How many 25 cm squares can she cut from it? _____
Remember 1 m = 100 cm.



Fill in the boxes with one-digit numbers to make multiples of 9.

3 8□4

66 66□

9□2

Fill in the boxes and triangles with one-digit numbers to make different multiples of 9.

4□6△

4□6△

4□6△

Daf and Laf are secret numbers.

Clue 1

Daf and Laf are two of these numbers.

$\sqcap$: Greatest common divisor $\sqcup$: Least common multiple

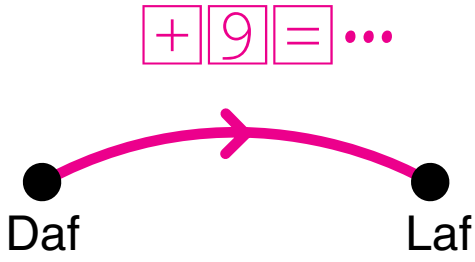
$20 \sqcap 12 =$ _____ $8 \sqcup 6 =$ _____

$18 \sqcap 45 =$ _____ $4 \sqcup 7 =$ _____

$27 \sqcap 21 =$ _____ $10 \sqcup 4 =$ _____

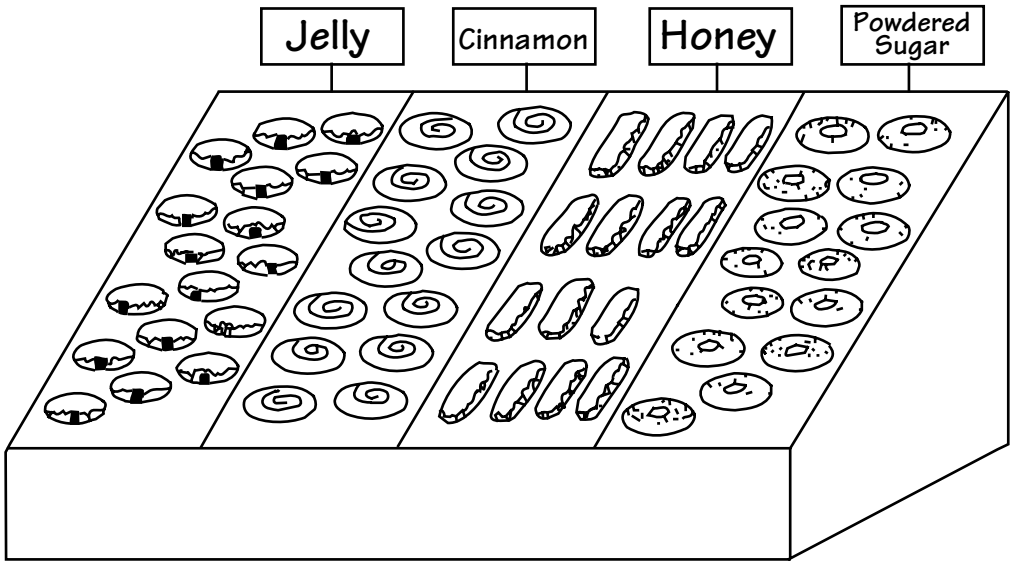
$45 \sqcap 20 =$ _____ $16 \sqcup 12 =$ _____

Clue 2



Who is Daf? _____

Who is Laf? _____

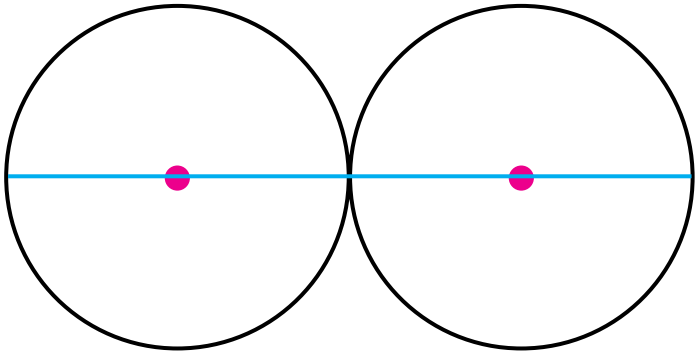


Don goes to the bakery. The baker sells only four types of donuts. He tells the baker to give him two donuts, any kind. (The two donuts do not have to be different kinds.) What are his chances of getting a jelly donut and a honey donut? Use this square to find the probability.

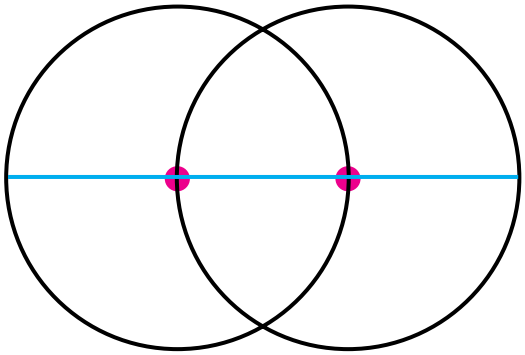
What is the probability of getting a jelly donut and a honey donut? _____

HINT: How many choices does the baker have when she picks the first donut? _____ Show that in the picture. After the first donut is chosen, how many choices does she have for the second donut? _____ Show that in the picture.

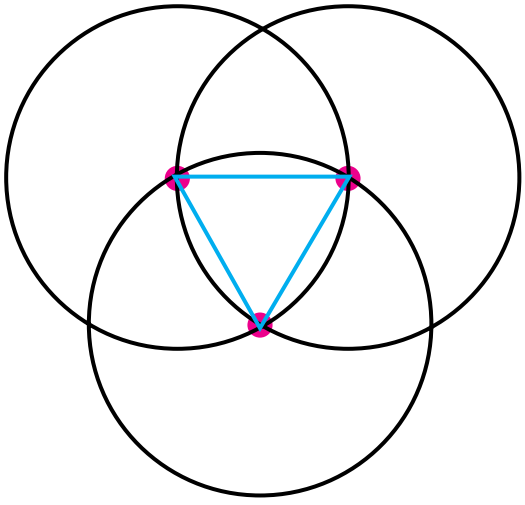
Each circle has its center marked with a red dot. The diameter of each circle is 4.5 cm.



What is the length of the blue segment? _____cm



What is the length of the blue segment? _____cm



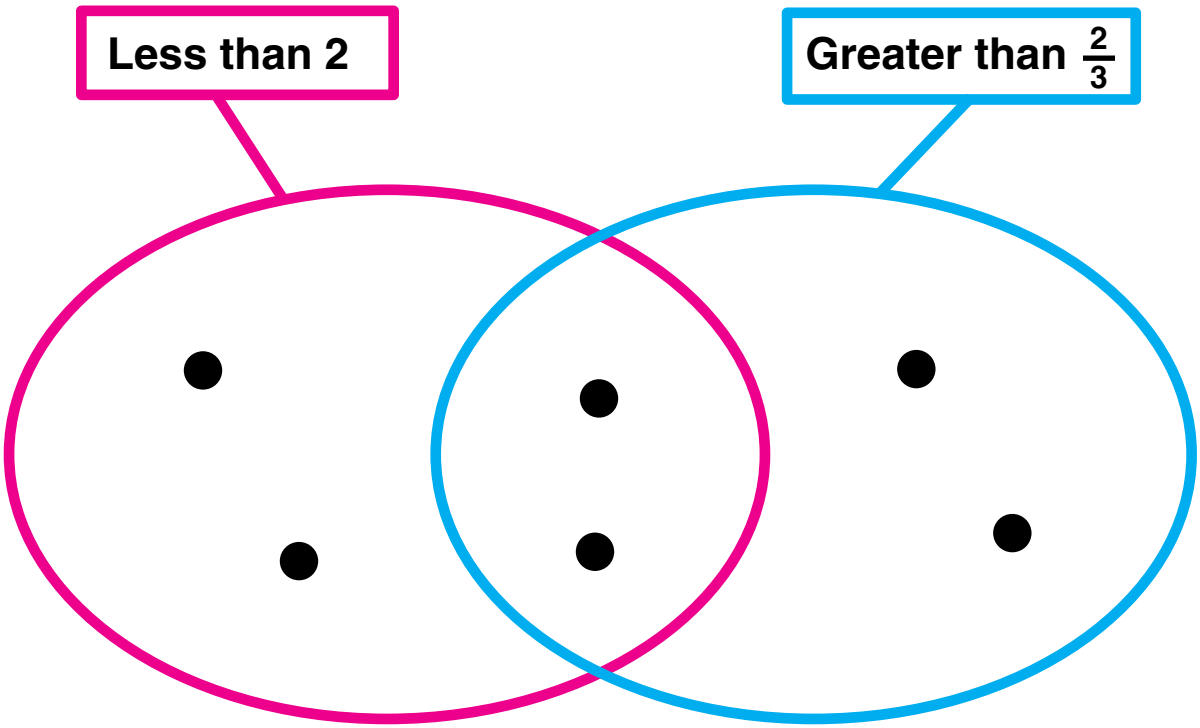
What is the perimeter of the blue triangle? _____cm

Label the dots. Some of the numbers have two names listed. Write both names for those numbers beside their dots.

$3 \div 4$ $\quad$ $1.8 + 0.4$ $\quad$ $2 - \frac{8}{5}$

$\frac{1}{3} \times \frac{2}{3}$ $\quad$ $\frac{3}{2} \times \frac{5}{3}$ $\quad$ $\frac{3}{2} - \frac{3}{4}$ $\quad$ $\frac{7}{10} + \frac{1}{2}$

$3.3 - 2.9$ $\quad$ 5×0.5 $\quad$ 3×0.4



Fill in the boxes with whole numbers.

Example: $4^3 = 4 \times 4 \times 4 = \boxed{64}$

$7^2 = \square$ $\quad$ $5^2 = \square$

$7^3 = \square$ $\quad$ $5^3 = \square$

$20^3 = \square$ $\quad$ $5^4 = \square$

$4^{\square} = 16$ $\quad$ $\square^2 = 121$

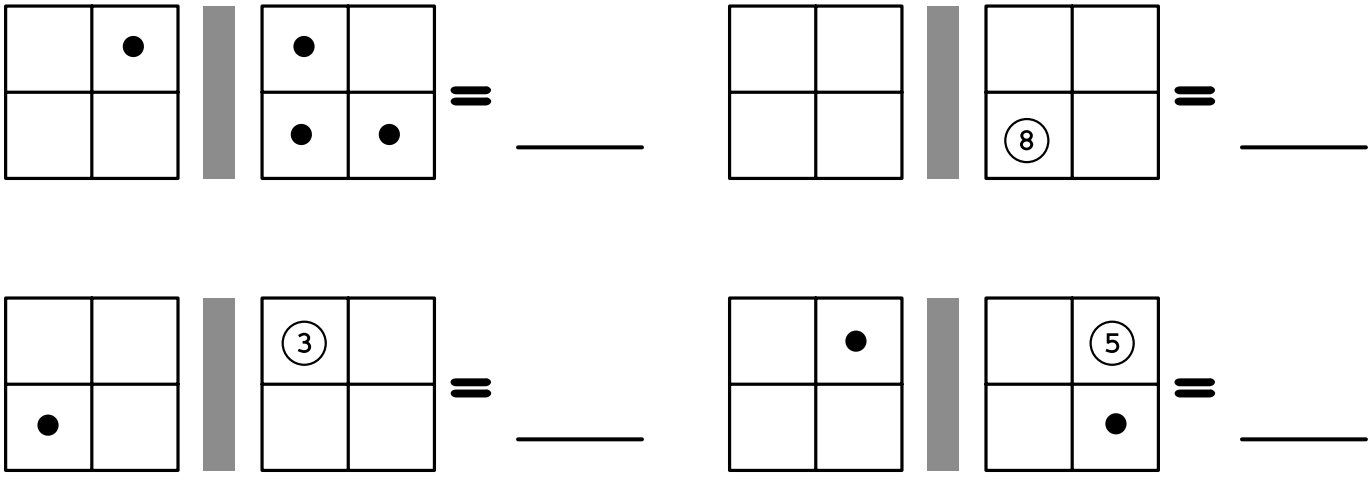
$3^{\square} = 81$ $\quad$ $\square^2 = 900$

$2^{\square} = 512$ $\quad$ $\square^3 = 216$

Fia is a secret number.

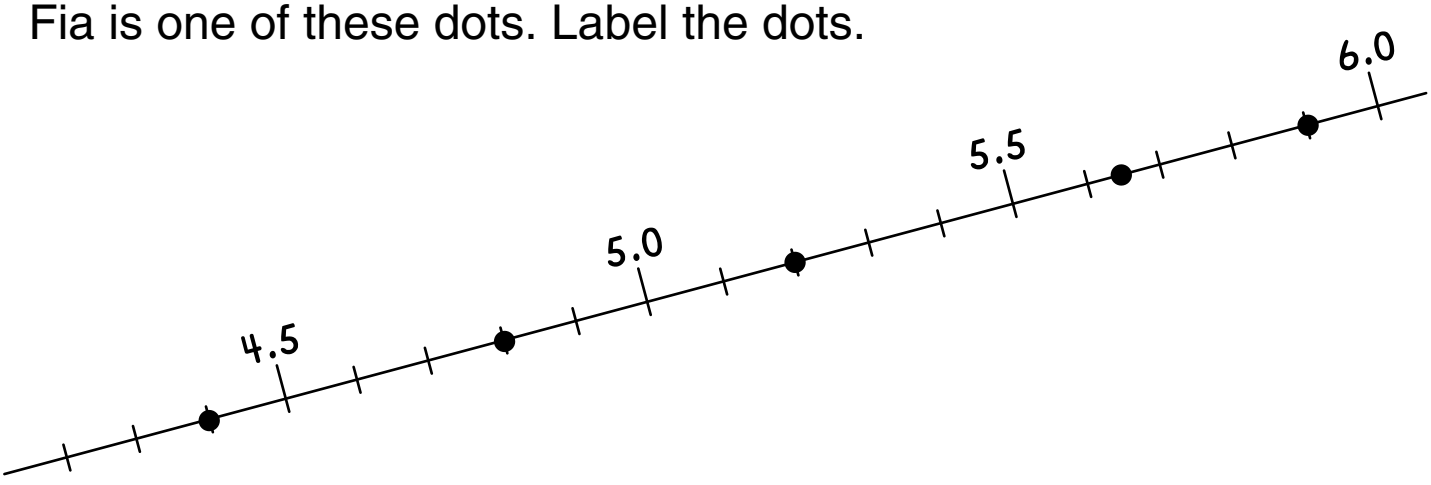
Clue 1

Fia is one of these numbers.



Clue 2

Fia is one of these dots. Label the dots.



Who is Fia? _____

Match each red tag with a blue tag.

$\frac{7}{10} - \frac{1}{5}$	0.55
$1\frac{3}{10} - \frac{7}{10}$	6.3
$\frac{1}{4} + \frac{3}{10}$	0.063
0.7×0.9	0.5
7×0.9	0.63
0.7×0.09	0.6

A market research survey of 200 people found that three-fourths of the people owned a VCR and only two-fifths of the people owned a computer. In this survey, 50 people owned both a VCR and a computer. How many in the survey owned neither a VCR nor a computer?_____
Explain your answer below.

In the same survey, the researchers found that one-half of the people used their VCR to watch movies they rent and one-half used the VCR to tape TV shows. Still, one-fifth of the people said they never used their VCR. Explain how this can be true.

Guess My Rule

The operation $*$ works on two numbers. Here are some clues.

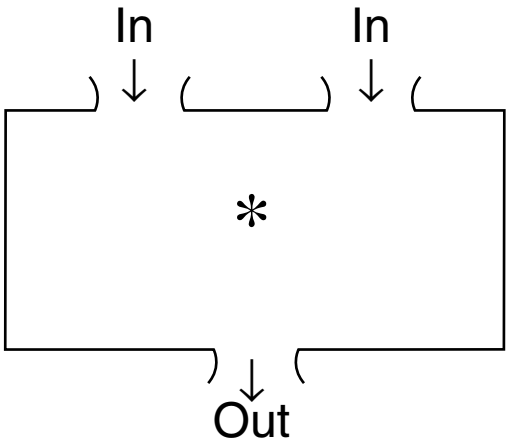
$3 * 2 = 8$

$2 * 3 = 9$

$6 * 4 = 28$

$0 * 5 = 5$

$7 * 1 = 8$



Describe the rule for $*$.

$a * b =$

Use the above rule for $*$ to fill in the boxes.

$7 * 6 = \square$

$9 * 12 = \square$

$3 * 7.2 = \square$

$\square * 1.5 = 18$

$4.5 * \square = 44$

$6 * 7 = \square$

$\square * 8 = 32$

$9 * \square = 44$

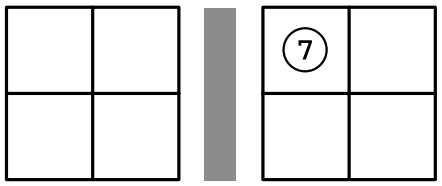
$11 * \widehat{4} = \square$

$\widehat{8} * 9 = \square$

Elsa is a secret number.

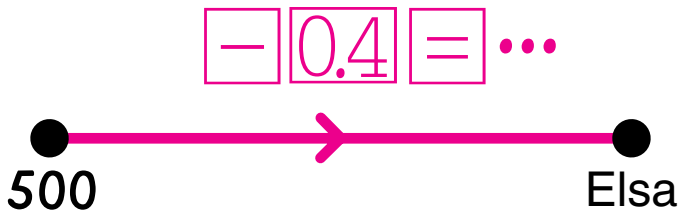
Clue 1

Elsa can be put on this Minicomputer by adding exactly one ⑨-checker.



Elsa could be _____, _____, _____, _____, _____, _____, _____, or _____.

Clue 2



Elsa could be _____, _____, _____, _____, or _____.

Clue 3

A name for Elsa can be written by adding two sets of parentheses to this expression.

$$8 \times 4 + 6 \div 5$$

Who is Elsa? _____

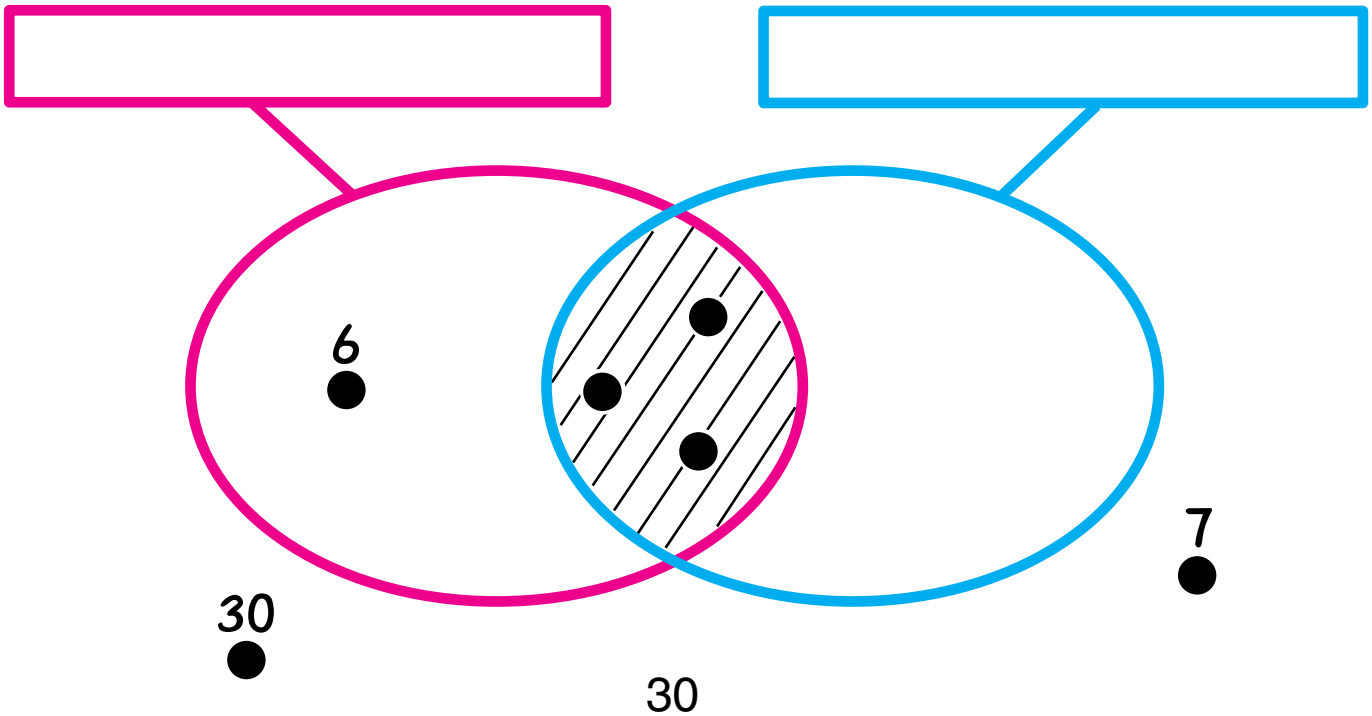
The red label is one of these:

Multiples of 3
Multiples of 4
Multiples of 5
Odd numbers
Positive prime numbers
Less than 10
Positive divisors of 18
Positive divisors of 20
Positive divisors of 24

The blue label is one of these:

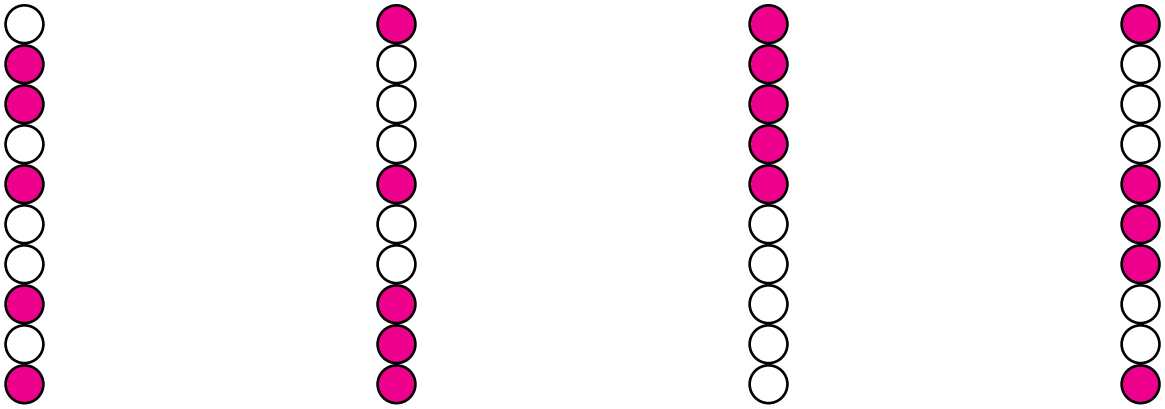
Multiples of 3
Multiples of 4
Multiples of 5
Odd numbers
Positive prime numbers
Less than 10
Positive divisors of 18
Positive divisors of 20
Positive divisors of 24

Label the strings.



How many ways can Theophilus's friend arrange 5 white beads and 5 red beads on a pole? _____

Remember that there are 210 ways to arrange 6 white beads and 4 red beads on a pole. Show your work.



Loki is a secret whole number.

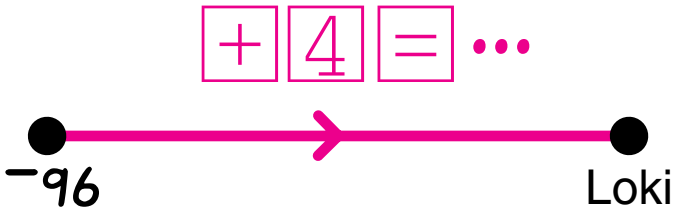
Clue 1

$$\text{Loki} \sqcap 15 = 5$$

Find a pattern for the numbers that Loki could be.

Loki could be ____ or ____ or ____ or ____ or ____ or ____ or ____ or ____, and so on.

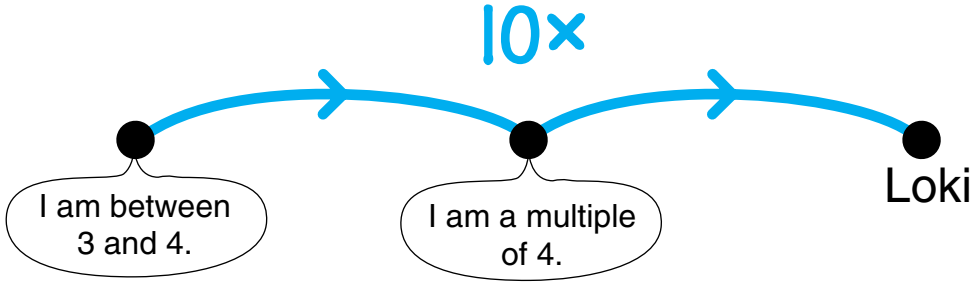
Clue 2



Find a pattern for the numbers Loki could be.

Loki could be ____ or ____ or ____ or ____ or ____ , and so on.

Clue 3



Who is Loki? _____