Collage
of
Problems #5

For each problem, list at least four <u>whole</u> numbers that could be in the box.

13 ⟶ 53

$+$ ☐ $=$ •••

_____, _____, _____, _____

15 ⟶ −13

$-$ ☐ $=$ •••

_____, _____, _____, _____

−10 ⟶ 35

$+$ ☐ $=$ •••

_____, _____, _____, _____
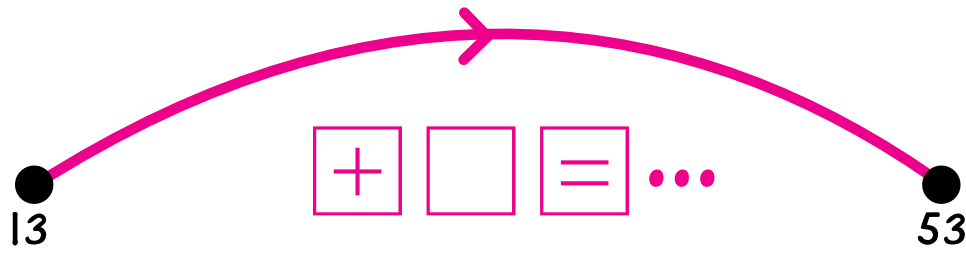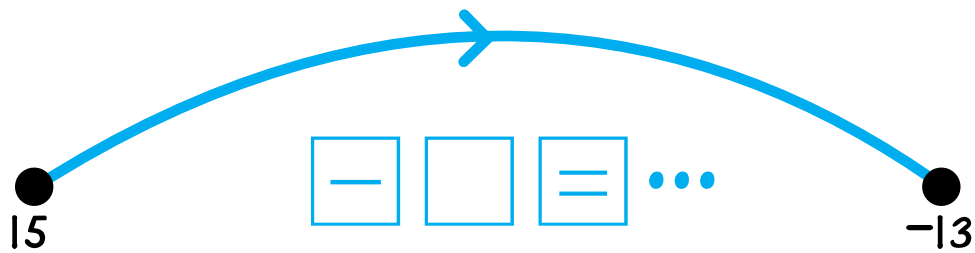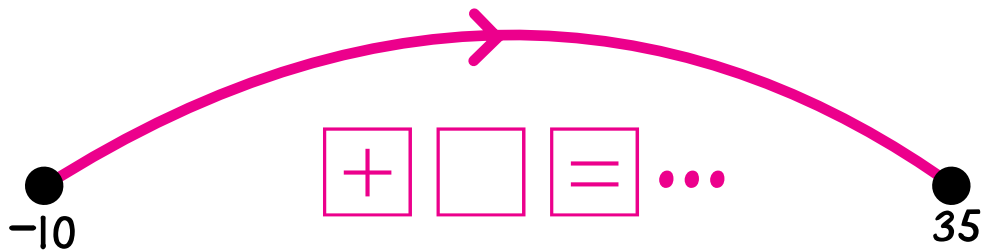
Complete the calculations. Show your work.

$$\begin{array}{r} 8.70 \\ 0.96 \\ + 0.40 \\ \hline \end{array}$$

$$0.08 + 7.153 + 64$$

$$\begin{array}{r} 65.70 \\ - \ 8.46 \\ \hline \end{array}$$

$$326 - 89.7$$

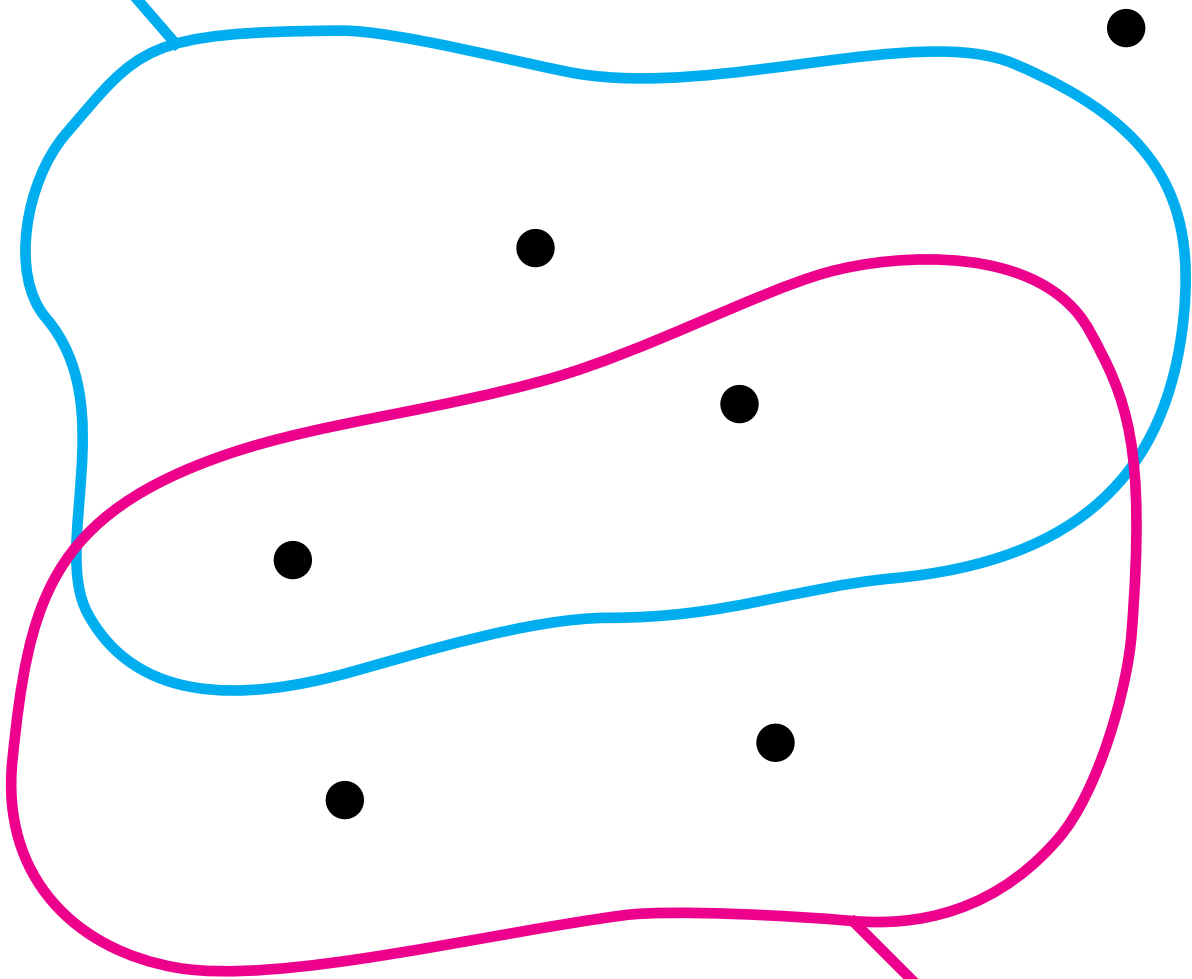Place these ordered pairs in the string picture.

(21, 7)   (42, 12)   (40, 8)

(25, 8)   (100, 5)   (29, 9)

is a multiple of

□ − 2 = ···

Build an arrow road from 3.5 to 26. Each arrow must be for **+**, **−**, **×**, or **÷** a one-digit whole number. Use as few arrows as you can.
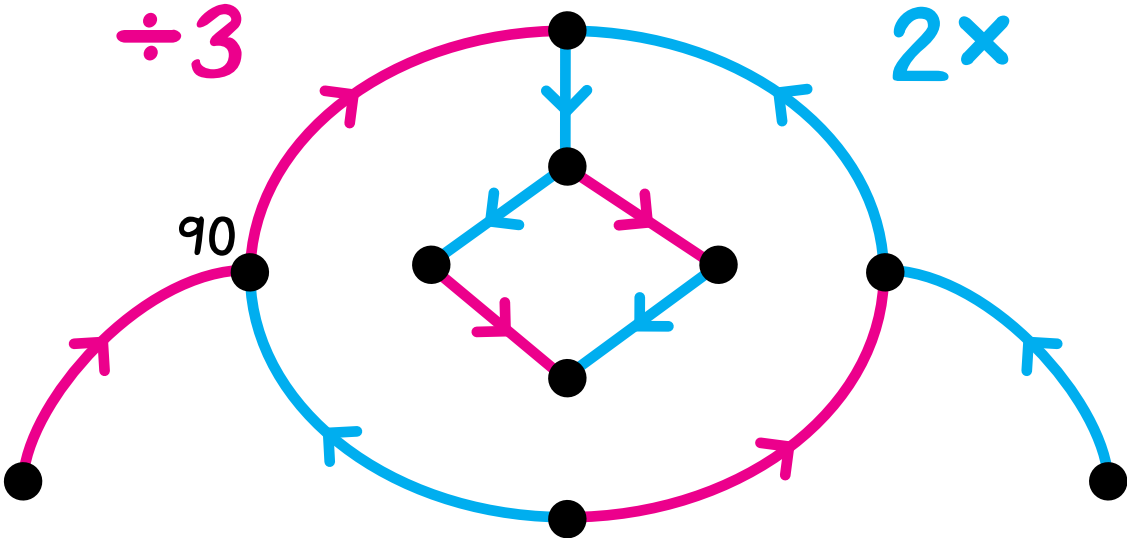
3.5
●

26
●

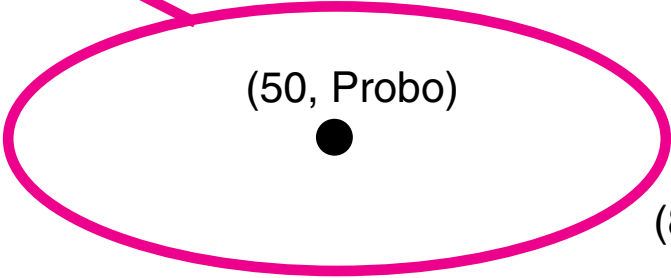Probo is a secret number.

Clue 1

Probo is in this arrow picture. Label the dots.

÷3   2×

90

Clue 2

is less than

(50, Probo)

(80, Probo)

Who is Probo? _____

Fill in the boxes with these numbers.

$$\frac{8}{3} \qquad \frac{9}{2} \qquad \frac{5}{8}$$

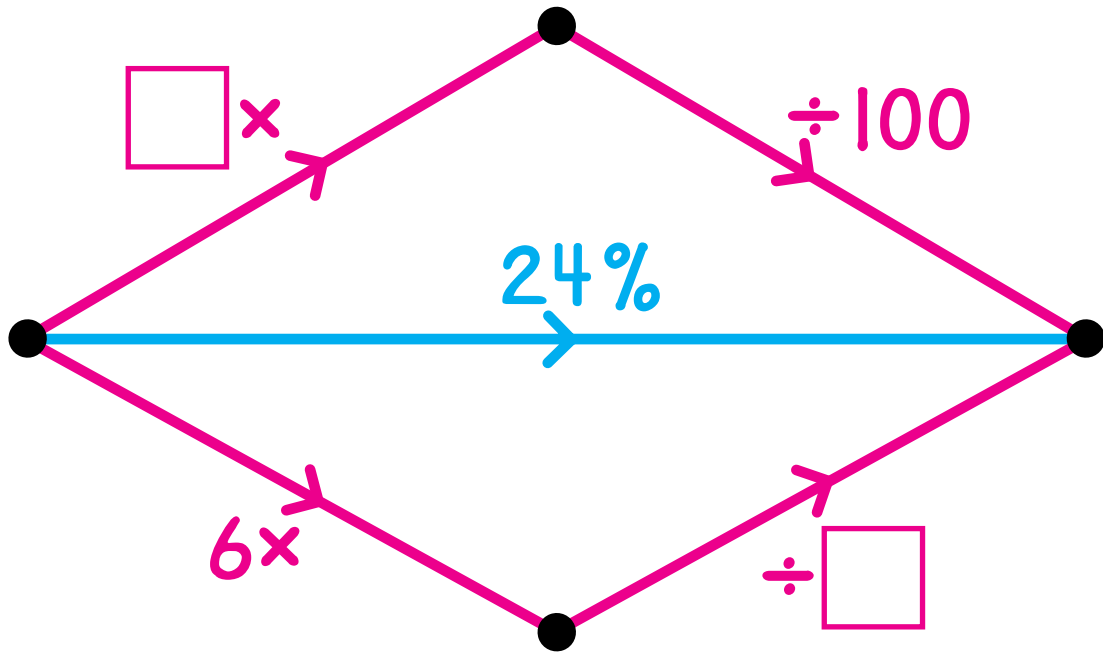$$\frac{5}{11} \qquad \frac{13}{11} \qquad \frac{37}{10}$$

$$0 < \boxed{} < \frac{1}{2} < \boxed{} < 1 < \boxed{} < 2$$

$$2 < \boxed{} < 3 < \boxed{} < 4 < \boxed{} < 5$$

Fill in the boxes for the arrows.

Complete.

24% of 60 = ___   24% of ___ = 60

124% of 60 = ___   24% of ___ = 36

48% of 60 = ___   24% of 36 = ___

A farmer must carry a fox, a goose, and a basket of cabbage across a river. The farmer's rowboat is large enough for the farmer and only <u>one</u> item. The farmer cannot leave the goose and cabbage together because the goose will eat the cabbage. Also, the fox and goose cannot be left together (for obvious reasons). Describe how the farmer can get all three items across the river safely. Try to use as few trips as possible.

Above each arrow, write what the farmer carries. You may not need all the arrows.

First trip across ⟶

First return trip ⟵

Second trip across ⟶

Second return trip ⟵

Third trip across ⟶

Third return trip ⟵

Fourth trip across ⟶

Fourth return trip ⟵

Fifth trip across ⟶

Complete.

60 × ____ = 420   60 × ____ = 42

60 × ____ = 42 000   60 × ____ = 0.42

Complete the calculations. Show your work.

Multiply.

37.6 × 0.06

Multiply.

63.8 × 1.49

Agaron Billiard Hall

A (   ) B
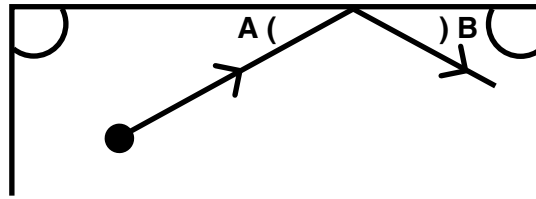
If a ball is hit with no spin, angle **B** will always equal angle **A**. Use this fact to draw the path of the ball in the following picture of a pool table.

G   H

I   J

K   L
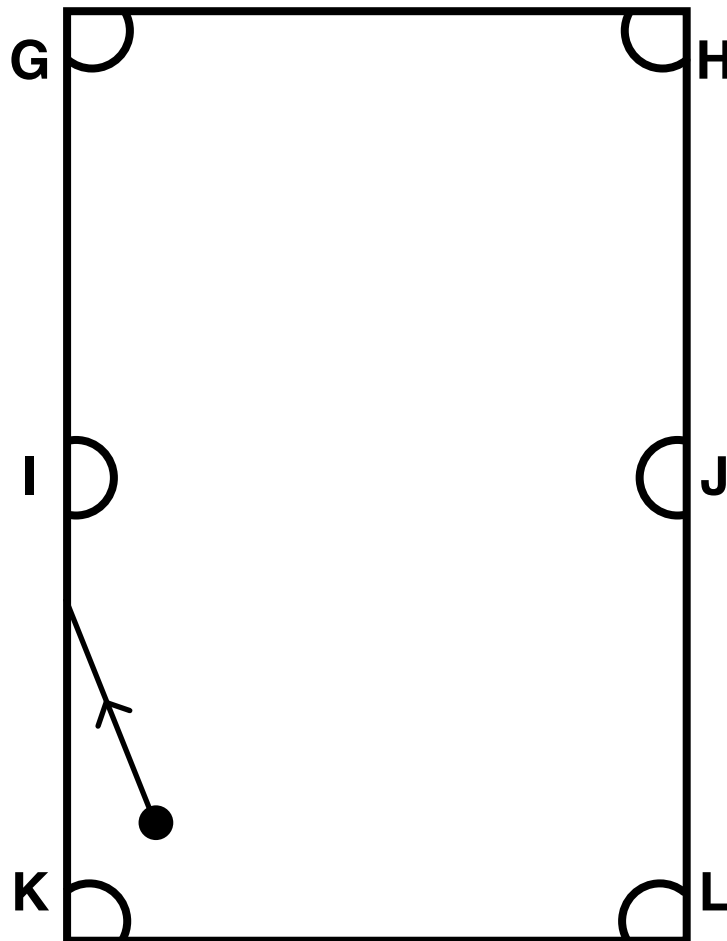
Which pocket does the ball enter? _____

Write each number as a product of positive prime numbers.
One is done for you.

$$280 = \underline{2 \times 2 \times 2 \times 5 \times 7 = 2^3 \times 5 \times 7}$$

$42 = $ _____

$90 = $ _____

$275 = $ _____

$392 = $ _____

Circle the two numbers above that are <u>divisors</u> of $2 \times 3^3 \times 5^2 \times 7^2$.

Put each of these numbers in the string picture.

$$\frac{5}{3} \qquad \frac{3}{7} \qquad \frac{3}{5} + \frac{4}{5} \qquad \frac{7}{8} - \frac{1}{8}$$

$$\frac{4}{3} \times \frac{1}{3} \qquad 50\% \text{ of } 1.8 \qquad 10\% \text{ of } 3$$

$$0.8 + 0.4 \qquad 1.39 - 0.6 \qquad 7 \times 0.4$$

Greater than $\frac{1}{2}$
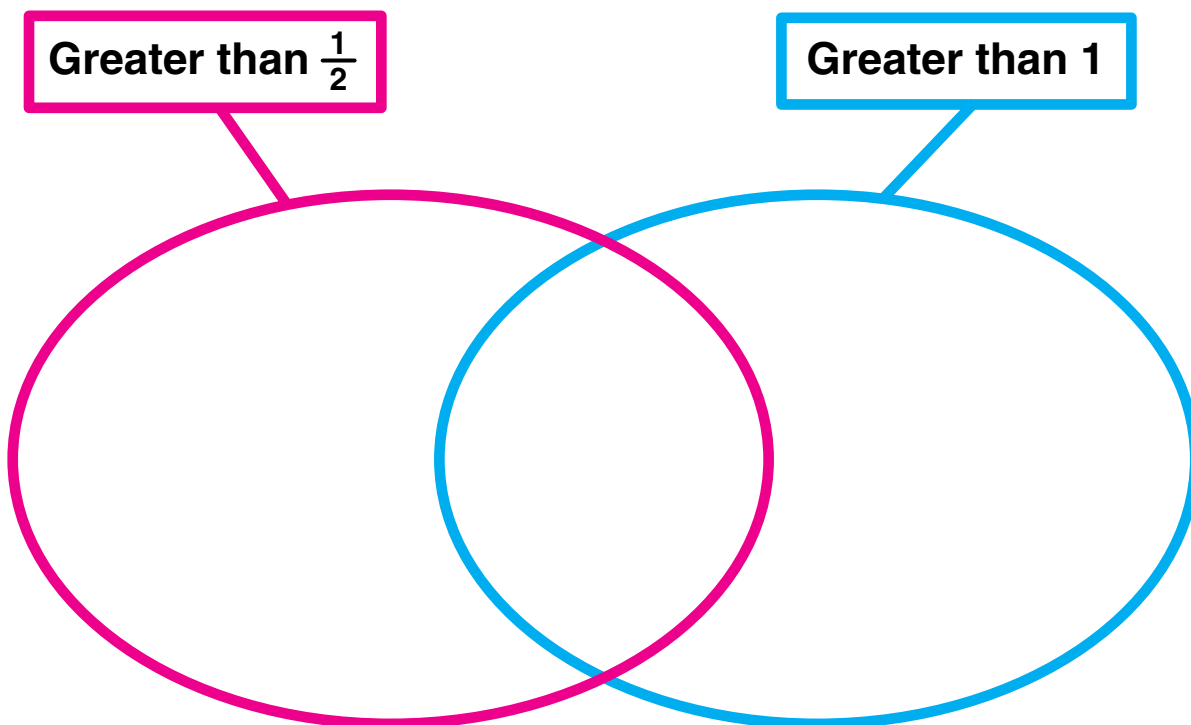
Greater than 1

One region of the picture can be hatched. Hatch it.

13

The red string is for one of these relations.

The blue string is for one of these relations.

is greater than
□ − 2 = ···
□ − 3 = ···
□ − 4 = ···
□ − 5 = ···

is greater than
□ − 2 = ···
□ − 3 = ···
□ − 4 = ···
□ − 5 = ···

Label the strings.

(8,⁻7)

(3,⁻9)

(0,⁻18)
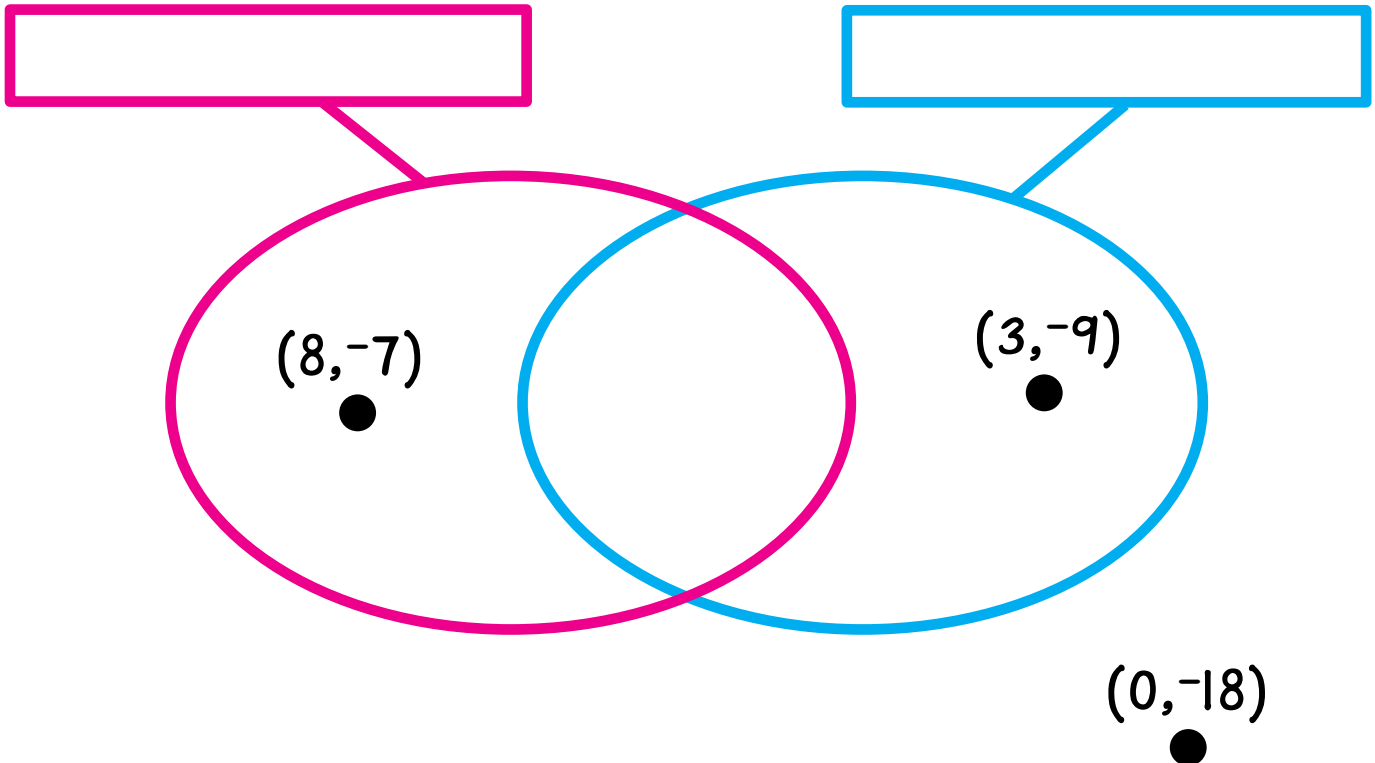
Write three division problems with the same answer as this division problem.

$$18 \div 2.5$$

_____

_____   _____

Complete these calculations. You may change each problem into a problem with the same answer. Show your work.

Divide.

$$18 \div 2.5$$

Answer: ☐.☐

Divide.

$$43.586 \div 0.62$$

Answer: ☐☐.☐

15
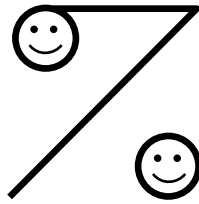
Use the arrow picture to help solve each problem. Label the dots and arrows; then answer the questions.

1. Norma buys a skateboard marked $42 and then pays 6% sales tax.

How much tax does Norma pay? _____
What is her total bill? _____

2. Ms. Hummel buys a bicycle for her son. With a 5% tax rate, she pays $4.50 tax on the bicycle.

How much does the bicycle cost (without tax)? _____
What is her total bill? _____

Put each number on the base $\widehat{2}$ abacus. Write the base $\widehat{2}$ name for each number. One is done for you.
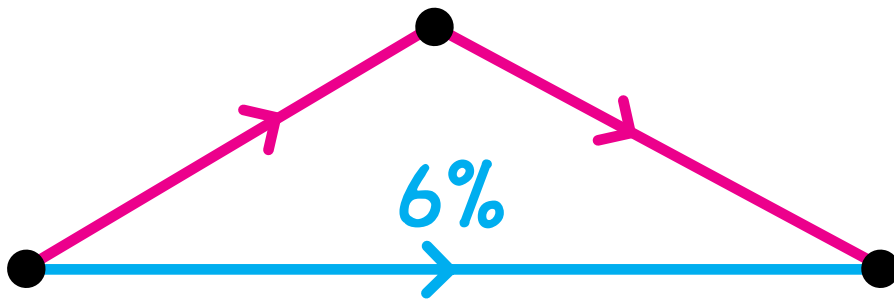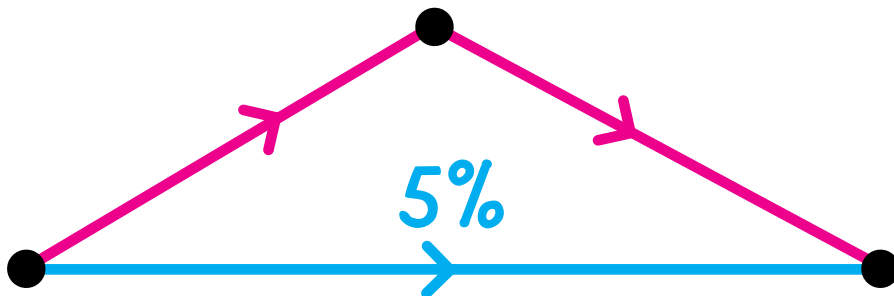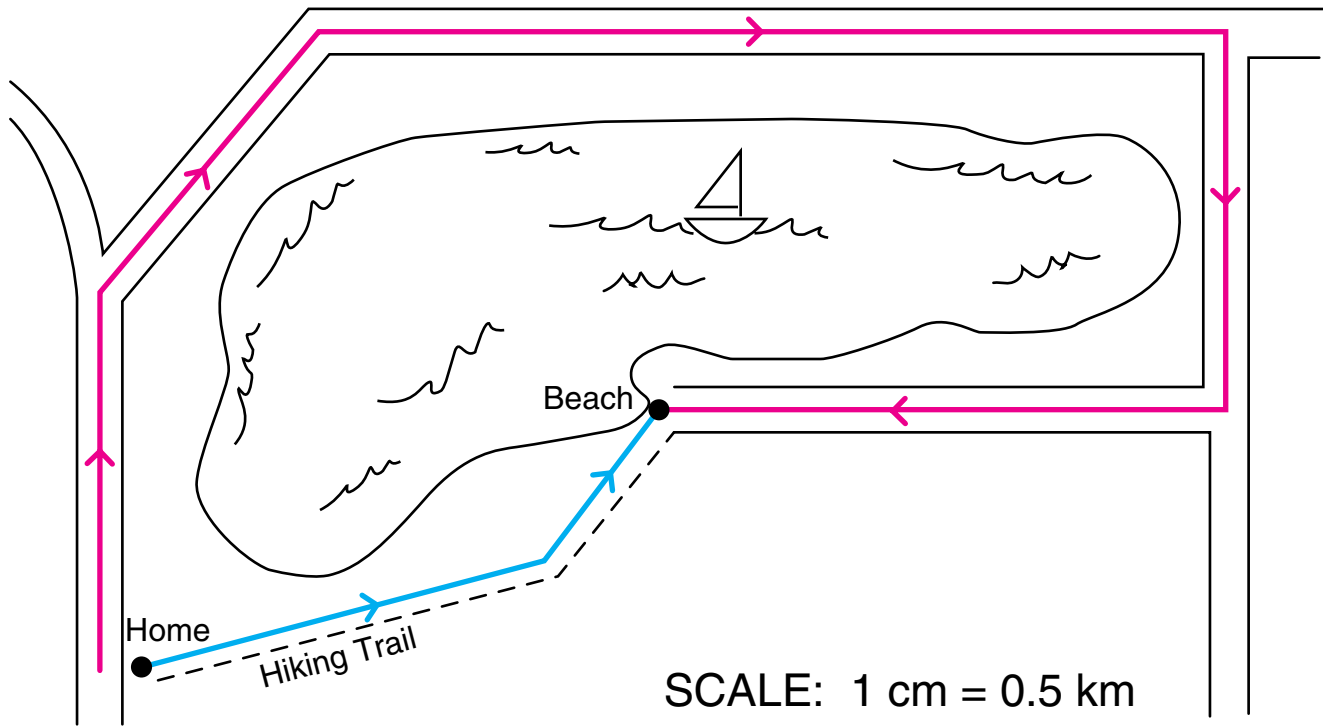
Decimal Name								Base $\widehat{2}$ Name

	$\widehat{32}$	16	$\widehat{8}$	4	$\widehat{2}$	1		
1 =								= _____

	$\widehat{32}$	16	$\widehat{8}$	4	$\widehat{2}$	1		
2 =				●	●			= 110

	$\widehat{32}$	16	$\widehat{8}$	4	$\widehat{2}$	1		
3 =								= _____

	$\widehat{32}$	16	$\widehat{8}$	4	$\widehat{2}$	1		
4 =								= _____

	$\widehat{32}$	16	$\widehat{8}$	4	$\widehat{2}$	1		
5 =								= _____

	$\widehat{32}$	16	$\widehat{8}$	4	$\widehat{2}$	1		
6 =								= _____

	$\widehat{32}$	16	$\widehat{8}$	4	$\widehat{2}$	1		
7 =								= _____

	$\widehat{32}$	16	$\widehat{8}$	4	$\widehat{2}$	1		
8 =								= _____

SCALE: 1 cm = 0.5 km

Leticia enjoys running on the hiking trail (blue) from her home to the beach. Her brother, Tony, prefers riding his bicycle around the lake along the route marked in red.

Complete.

	Length of route on map	Actual distance traveled
Leticia (blue)	_____ cm	_____ km
Tony (red)	_____ cm	_____ km

Leticia runs an average of 10 km in one hour and Tony rides 20 km in one hour. About how long does it take Leticia to run on the hiking trail from her home to the beach? _____ minutes

About how long does Tony take to ride his bicycle on the roads from his home to the beach? _____ minutes

(Lif, Mif) is a secret ordered pair of numbers.

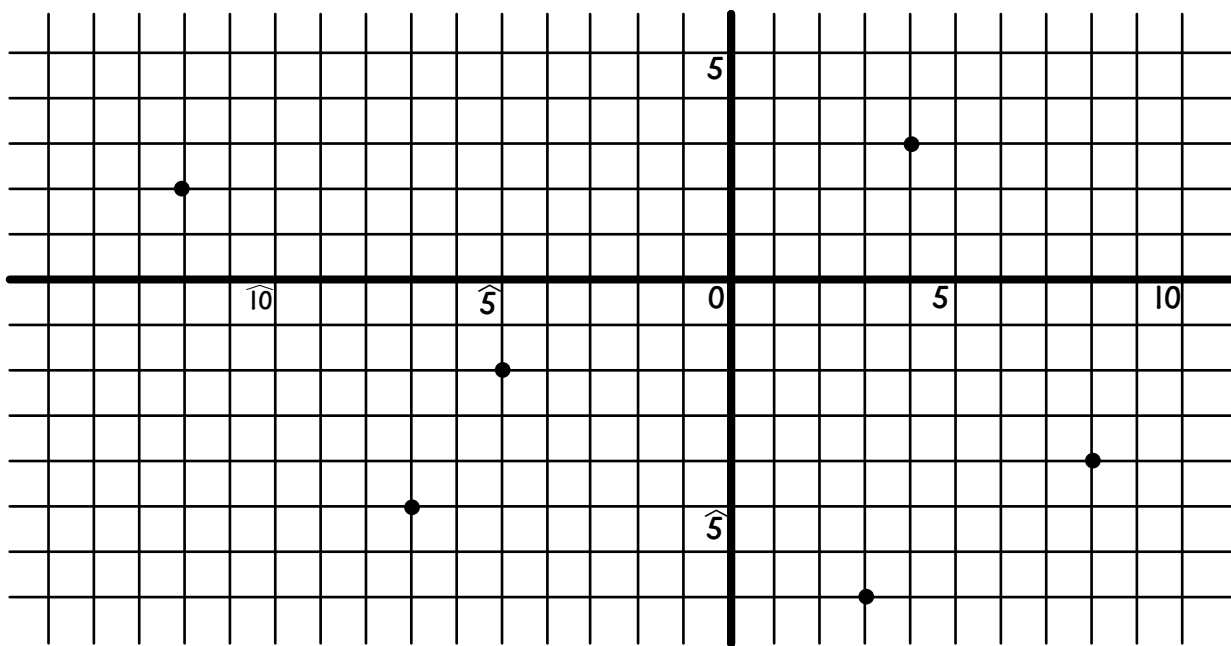Clue 1

−5= … ● Lif

13 ●

−3= … ● Mif
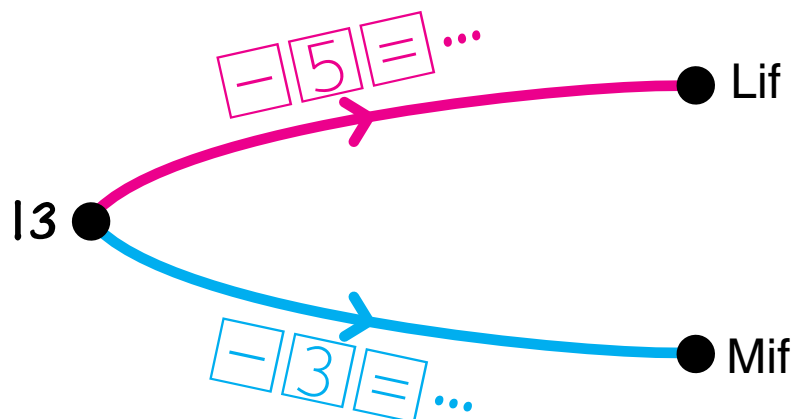
Lif could be _____, _____, _____, _____, _____, _____, _____, and so on.

Mif could be _____, _____, _____, _____, _____, _____, _____, and so on.
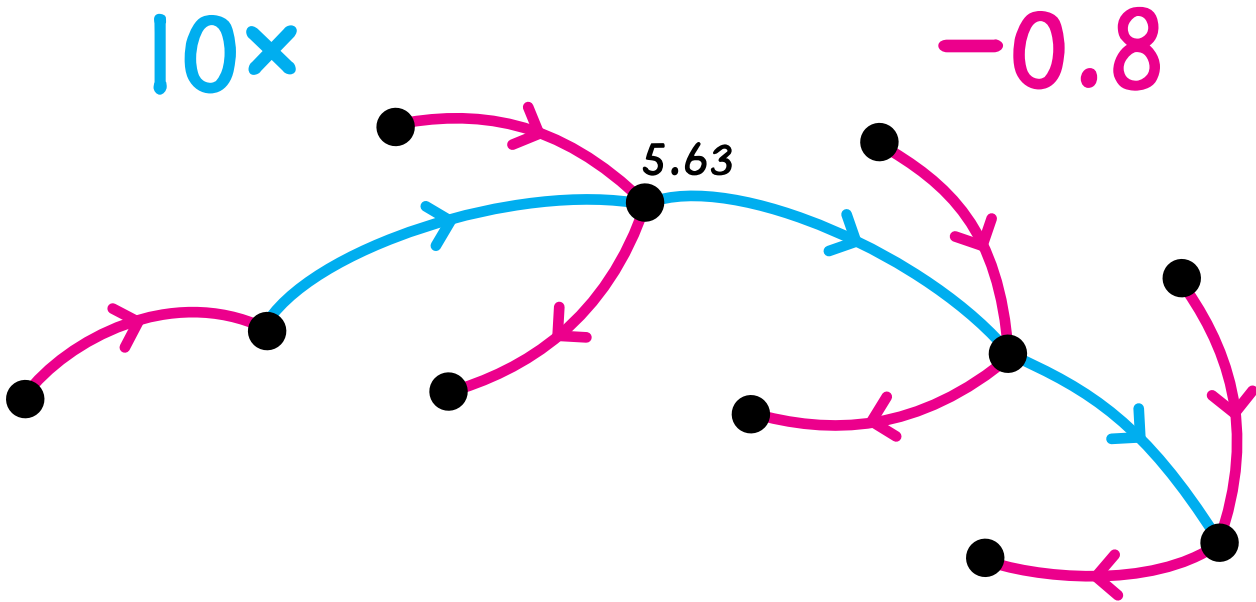
Clue 2

(Lif, Mif) is one of the dots on this grid.

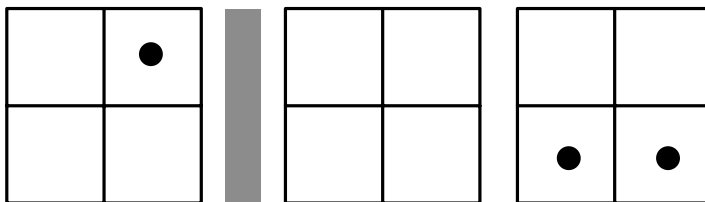(Lif, Mif) = (_____, _____).

19

Zen is a secret number.

Clue 1

Zen is in this arrow picture.

Clue 2

Zen can be put on this Minicomputer by adding just a ③-checker.

Who is Zen? _____

EARL's
Parking Lot

$0.30 for each $\frac{1}{4}$ hour

How much does it cost to park a car for 1 hour? _____

10 hours? _____

About how long was a car parked if the charge is $0.90? _____

$3.00? _____

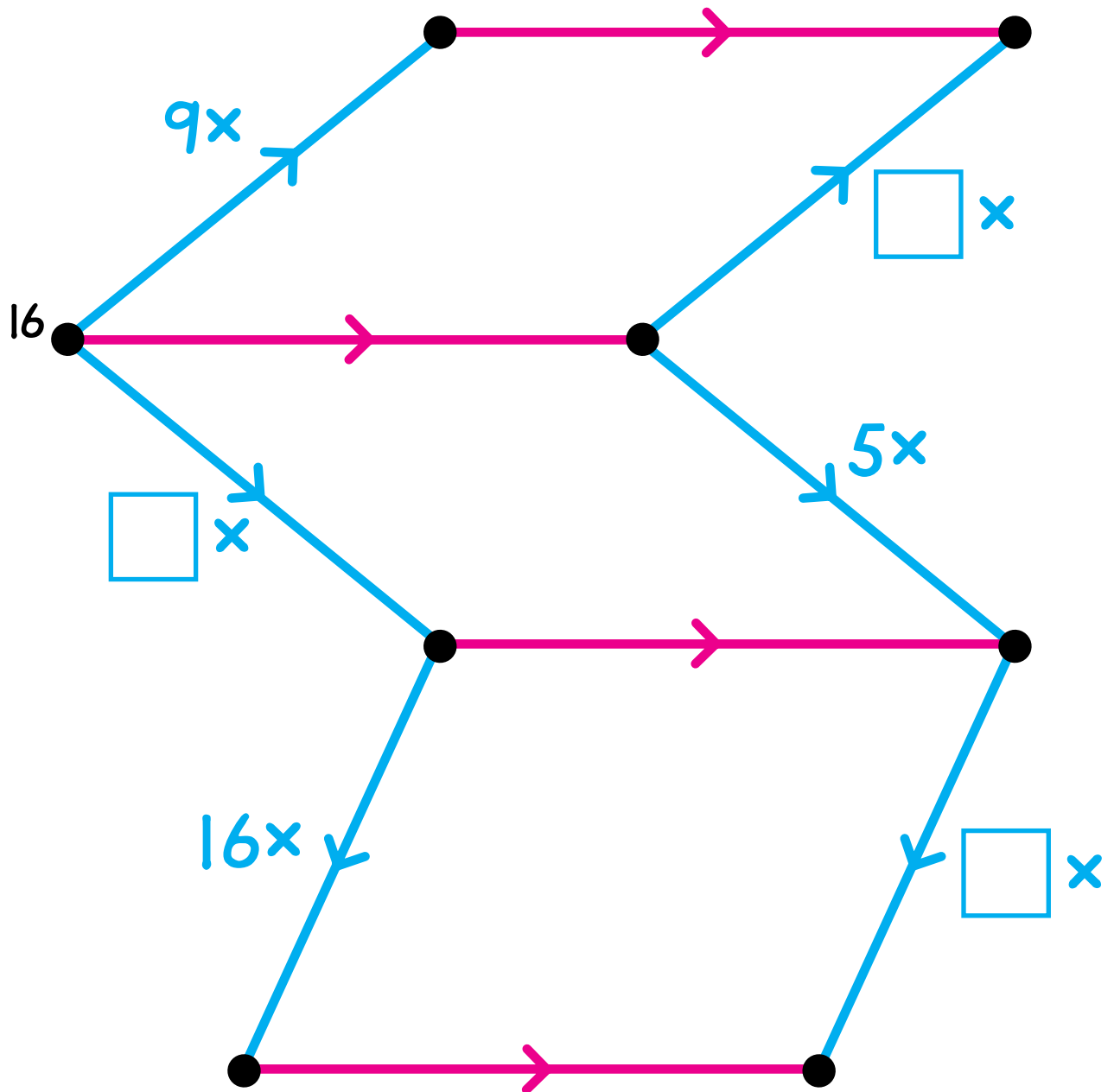Sharon parked her car from 11:20 AM to 1:20 PM. How much must she pay? _____

Douglas parked his car from 5:45 PM to 7:00 PM. How much must he pay? _____

Carlos parked his car at 7:50 PM. When he left the lot, he had to pay $0.60. About what time did he leave the lot? _____

The dots are for <u>positive</u> numbers.
Label the dots and fill in the boxes for the blue arrows.

is the square of

9×

□×

16

5×

□×

16×

□×

Place these numbers in the string picture.

$$2 \times 3^2 \qquad 11^3 \qquad 3^2 \times 11^2$$

$$11^2 \qquad 3^4 \times 11^3 \qquad 3^3 \times 11$$

$$3^4 \qquad 3^5 \qquad 7 \times 11^2$$

Positive divisors of 3^4 x 11^2

Positive divisors of 3^2 x 7 x 11^3
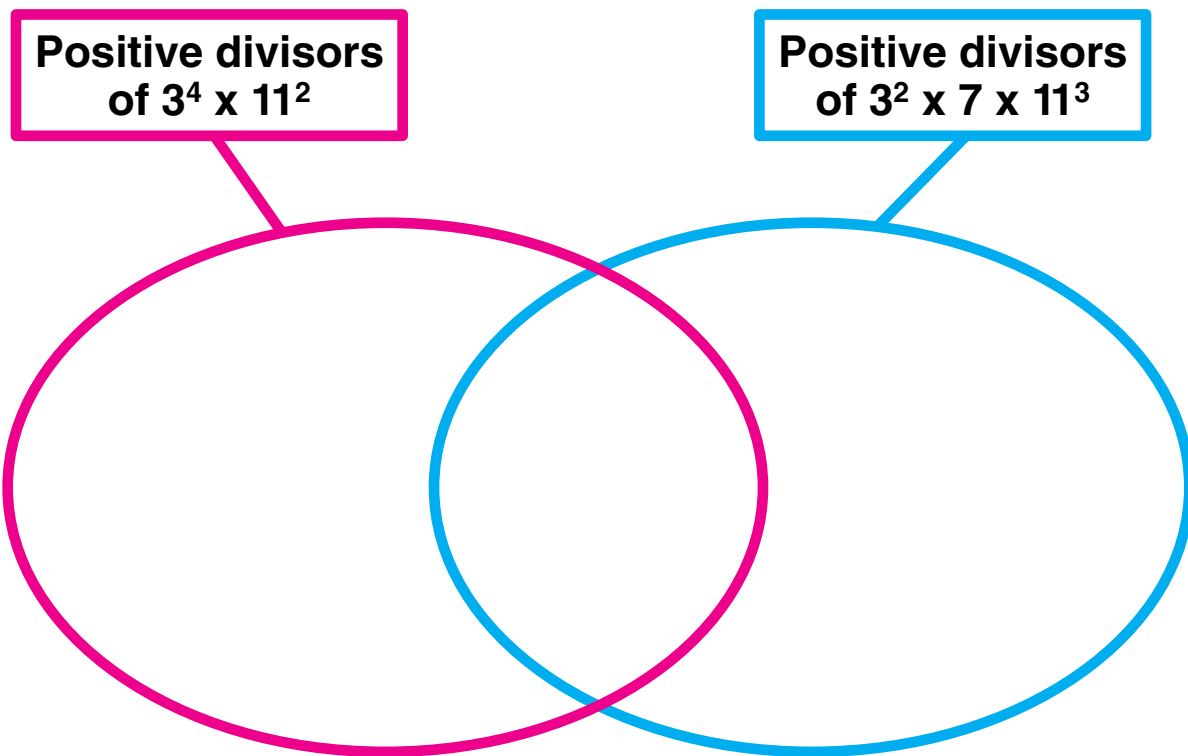
For each problem, list at least three whole numbers that could be in the box.

31.4 $-$ $\square$ $=$ ... 7.4

_____, _____, _____

$-$2.1 $+$ $\square$ $=$ ... 15.9

_____, _____, _____

6.7 $-$ $\square$ $=$ ... $-$13.3

_____, _____, _____
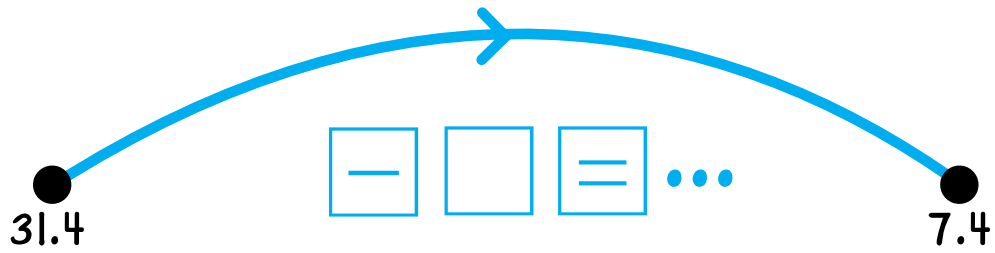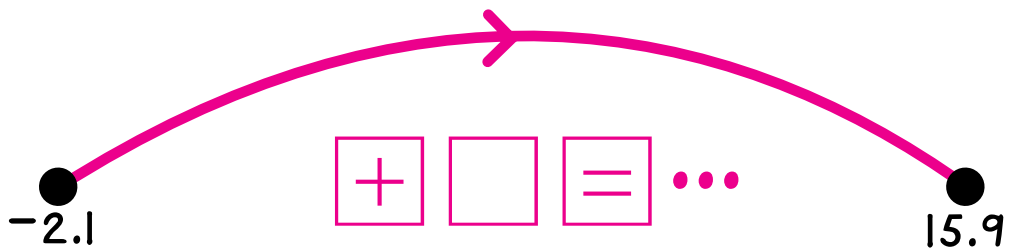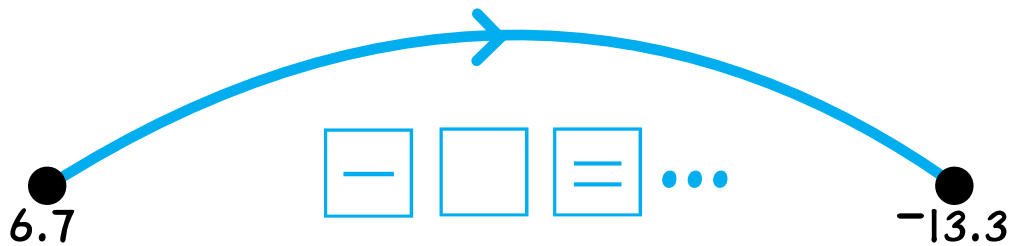
$$a * b = \left(\tfrac{1}{2} \times a\right) - b$$

Example: $6 * 5 = \left(\tfrac{1}{2} \times 6\right) - 5 = 3 - 5 = \widehat{2}$

Complete.

$12 * 3 = \boxed{}$ $\qquad$ $2.5 * 0.5 = \boxed{}$

$23 * 8 = \boxed{}$ $\qquad$ $7 * 5 = \boxed{}$

$10 * \boxed{} = 1.5$ $\qquad$ $\boxed{} * 7 = 8$

$26 * \boxed{} = 3$ $\qquad$ $\boxed{} * 10 = 7$

$\dfrac{2}{3} * \dfrac{1}{4} = \boxed{}$ $\qquad$ $\dfrac{4}{5} * \boxed{} = \widehat{\dfrac{1}{5}}$

25

Label the dots and fill in the box for the gray arrows.

$+ \dfrac{2}{3}$

5

9x

$+ \boxed{}$
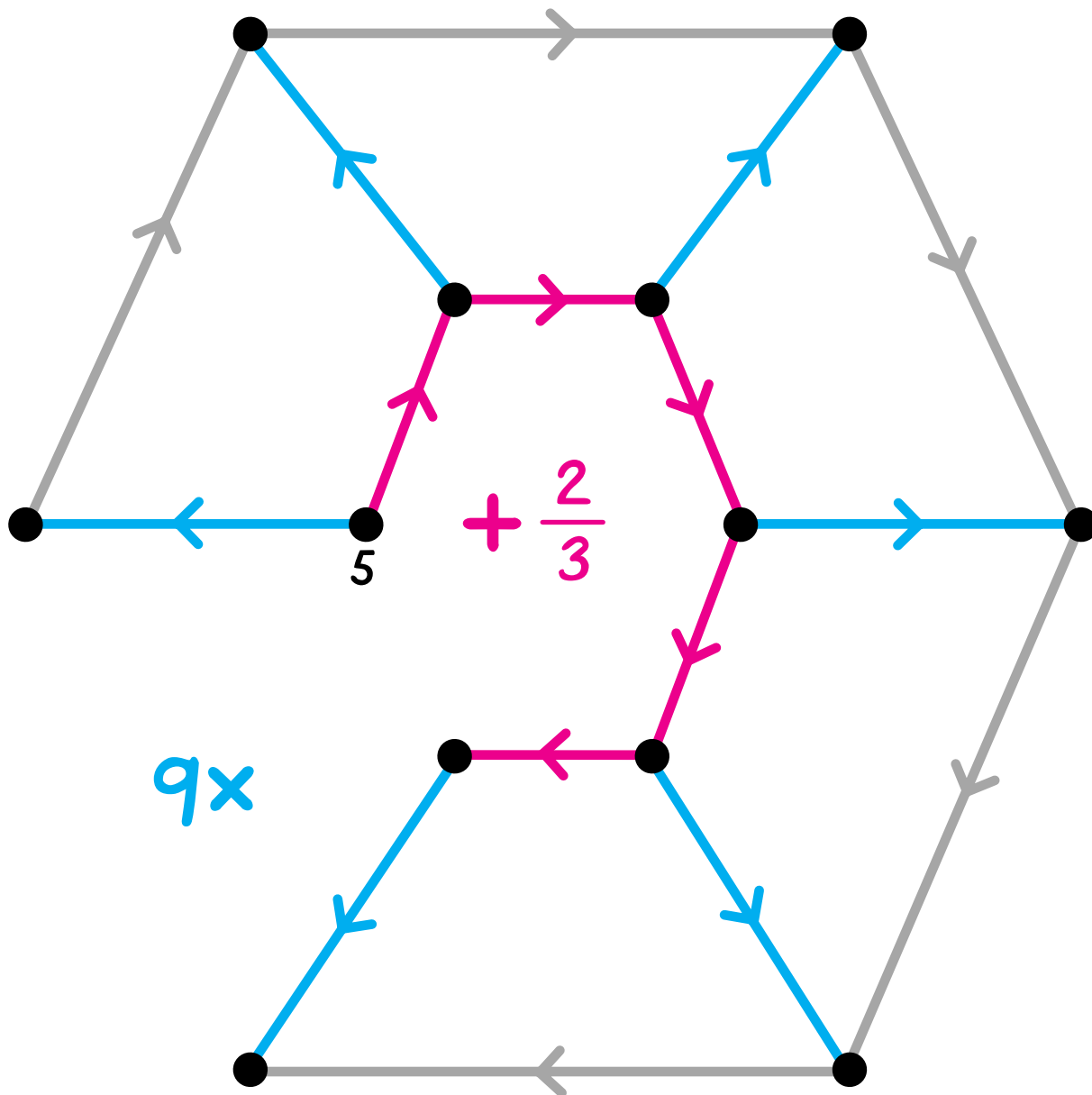
1. Toby is now three times as old as Leo. In eight years, Toby
    will be only twice as old as Leo. How old is Toby now? _____
                                                   Leo? _____

2.

State Theater

Now playing: The Wild
and Crazy Guys!

Adults: $3.00
Children: $2.00

Theater Owner: How many customers did we have tonight?

Ticket Seller: Only 80.

Owner: How many adults?

Seller: I forgot to count how many.
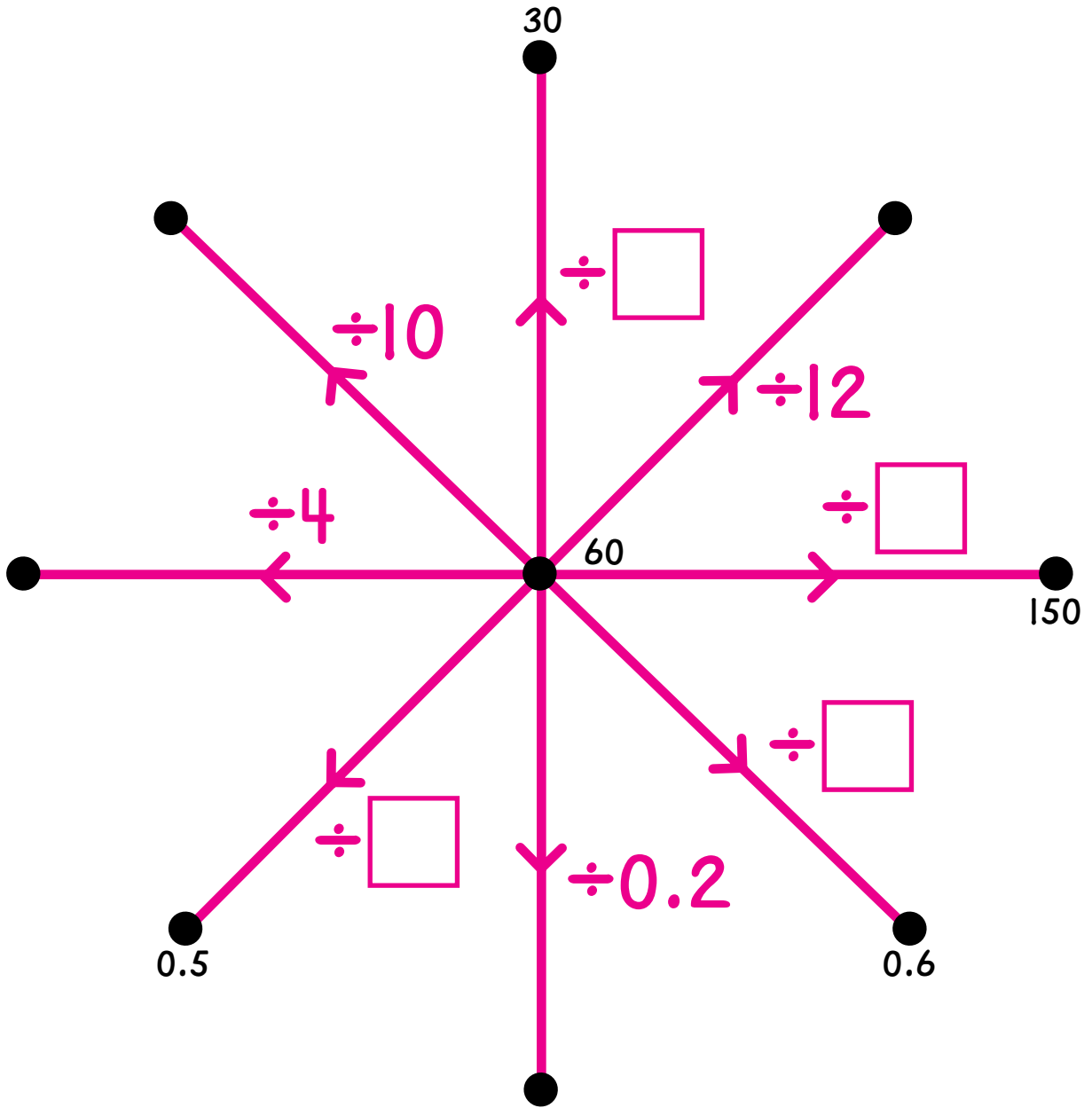
Owner: Do you know how much money we received?

Seller: Yes, $184.

Owner: Good; then I can calculate how many adults came.

How many adults came to the movie? _____
How many children? _____

Label the dots and fill in the boxes for the arrows.

30

÷10

÷4

÷□

÷12

60

÷□

150

÷□

÷0.2

0.5

0.6

The red label is one of these:

Red labels
Multiples of 3
Multiples of 4
Multiples of 5
Odd numbers
Positive prime numbers
Less than 10
Positive divisors of 18
Positive divisors of 24
Positive divisors of 40

The blue label is one of these:

Blue labels
Multiples of 3
Multiples of 4
Multiples of 5
Odd numbers
Positive prime numbers
Less than 10
Positive divisors of 18
Positive divisors of 24
Positive divisors of 40

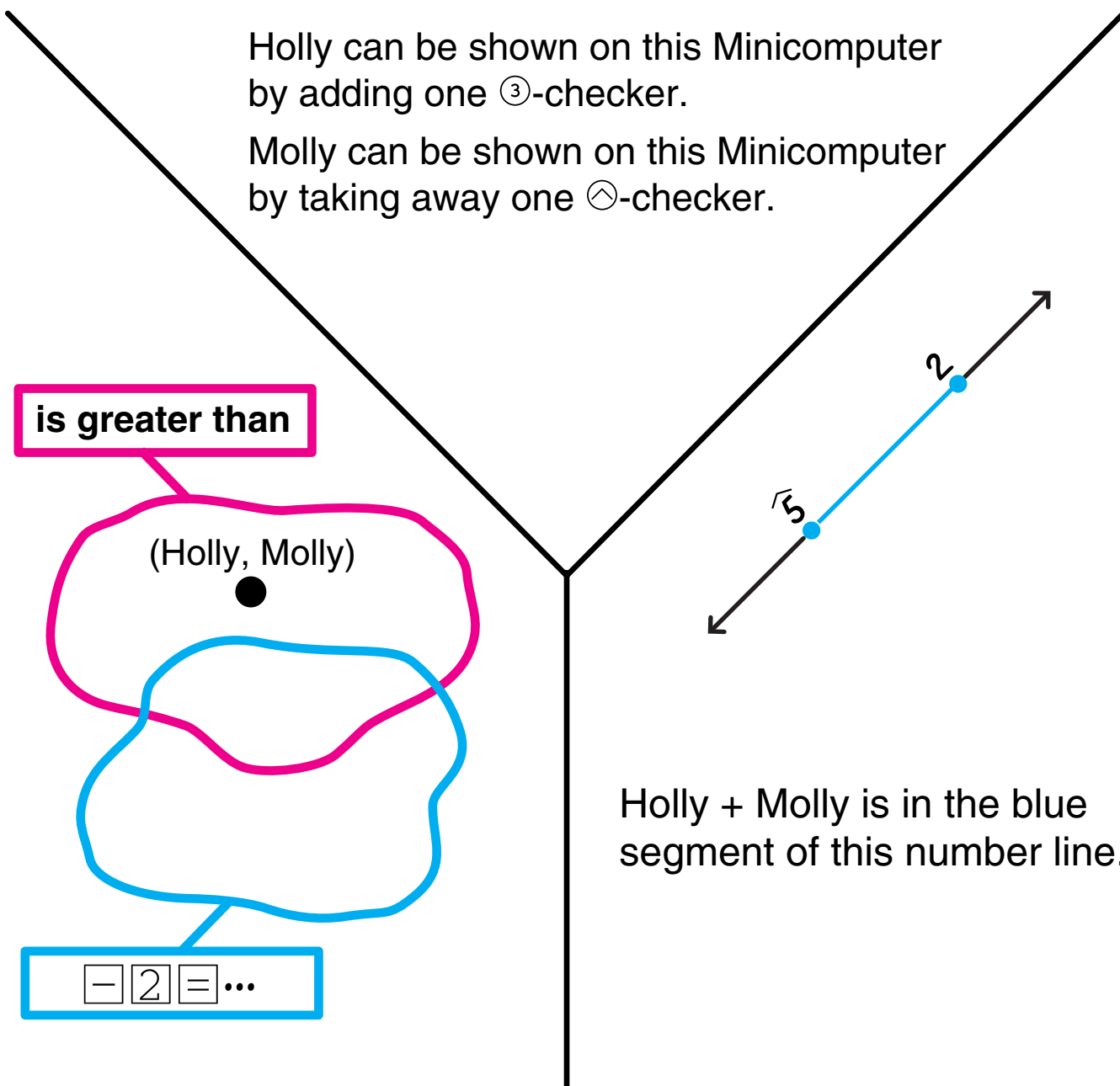Label the strings. Label the dots.

15

6

29
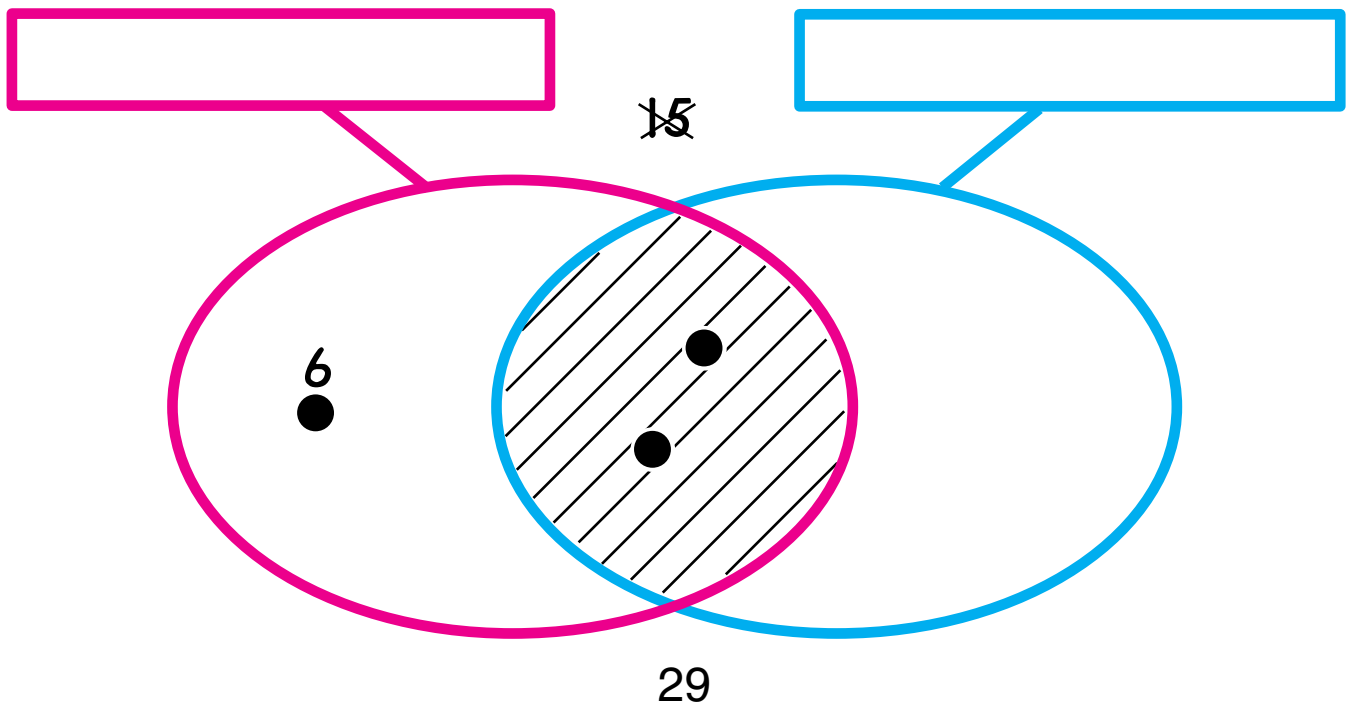
Holly and Molly are secret numbers.
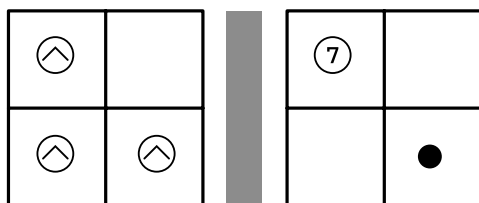
Holly can be shown on this Minicomputer by adding one ③-checker.

Molly can be shown on this Minicomputer by taking away one ⊗-checker.

is greater than

(Holly, Molly)

⊟2⊟ ···

Holly + Molly is in the blue segment of this number line.

(Holly, Molly) is (_____, _____).

Find the smallest positive integer N such that the product N x 135 is a square number.

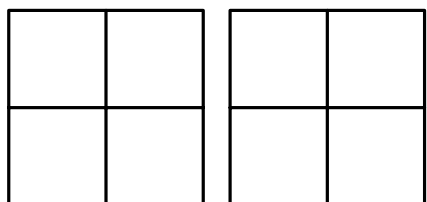Find the greatest square number that is a divisor of 64 800.

How many positive integers less than 100 have an odd number of positive divisors?

The product of two whole numbers is 1 000 000. If neither of the two whole numbers is a multiple of 10, what numbers are they?
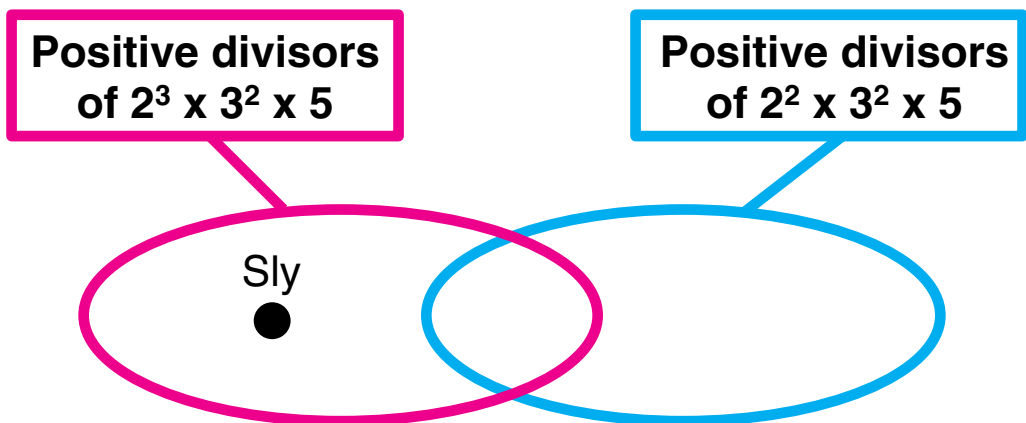
Sly is a secret number.

Sly can be put on this Minicomputer using exactly one of these checkers: ③, ⑨.

Sly could be _____

Positive divisors of $2^3 \times 3^2 \times 5$

Positive divisors of $2^2 \times 3^2 \times 5$

Sly

Sly could be _____, _____, _____, or _____.

$$\text{Sly} \sqcup 14 = 2^3 \times 3^2 \times 7$$

Who is Sly? _____