Collage
of
Problems #3

Pair the tags.

20 ●────→──── ● ────→──── ● 3
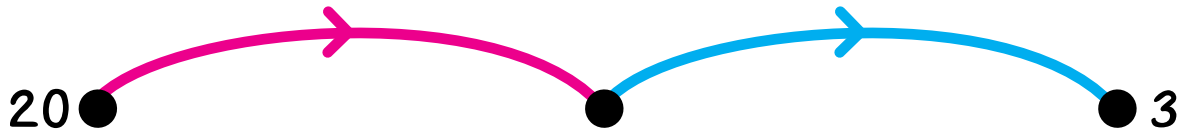
−8	+5
$\frac{1}{2}$×	÷4
$\frac{1}{5}$×	+13
3×	−57
−22	−1
−30	−7

Build an arrow road from 7 to 210. Each arrow must be for **+**, **−**, **×**, or **÷** a one-digit whole number. Use as few arrows as you can.

7
●

●
210

All of these calculations are correct, except that a decimal point is missing in each answer. Place a decimal point in each answer to make equations.

$$787.6 + 35.87 = 8\,2\,3\,4\,7$$

$$613.82 + 492.48 = 1\,1\,0\,6\,3$$

$$86.15 - 12.483 = 7\,3\,6\,6\,7$$

$$420.36 - 381.76 = 3\,8\,6$$

$$6.2 \times 4.5 = 2\,7\,9$$

$$31.53 \times 4.97 = 1\,5\,6\,7\,0\,4\,1$$

Fill in the blanks.

(7.6, _____)
●

10×

(274, _____)
●

(4.2, _____)
●

(5.07, _____)
●

(_____, 630)
●

(_____, 32)
●

(_____, 20.7)
●

(_____, 370)
●
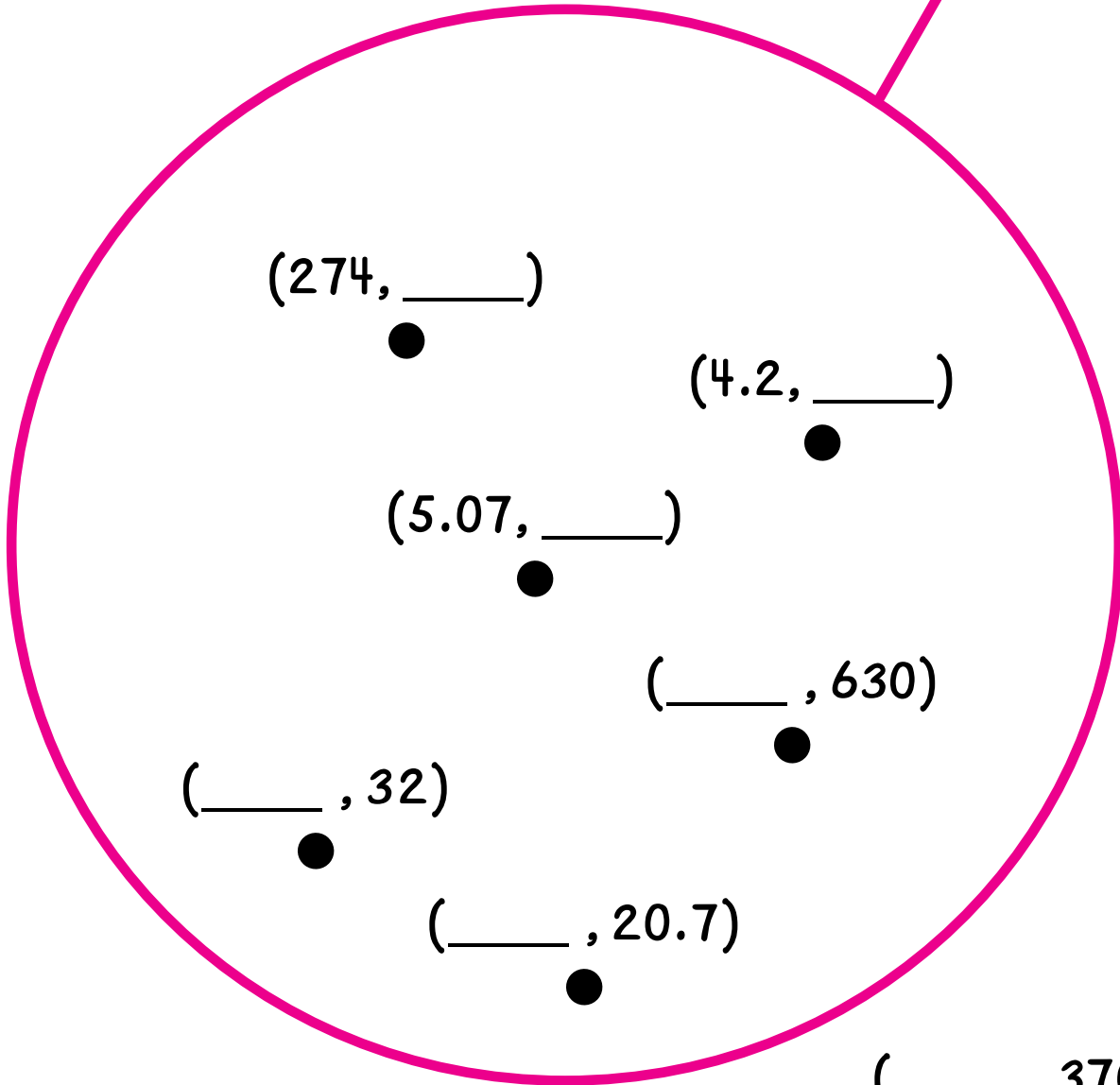
Fill in each box with <, >, or =. Try to solve these problems without doing any calculation.

736 + 587 $\boxed{}$ 587 + 426

1018 − 650 $\boxed{}$ 1018 − 200

500 + 700 $\boxed{}$ 520 + 680

82 ÷ 7 $\boxed{}$ 82 ÷ 3

70 × 36 $\boxed{}$ 7 × 360

58 × 67 $\boxed{}$ 71 × 58

$\dfrac{2}{3}$ $\boxed{}$ $\dfrac{2}{5}$

$\dfrac{3}{2}$ $\boxed{}$ $\dfrac{5}{2}$

6

Fill in the boxes for the arrows.
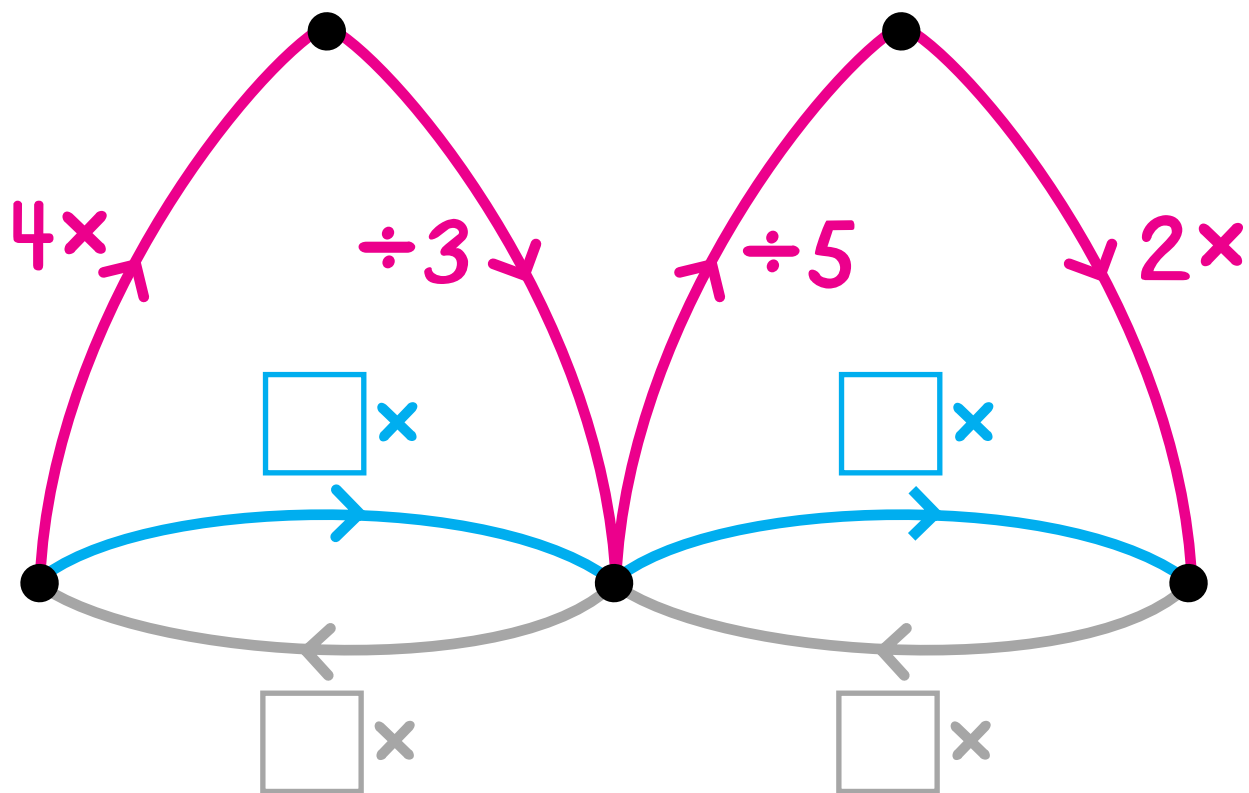
Complete these calculations.

$$\frac{4}{3} \times 12 = \underline{\quad}$$

$$\frac{2}{5} \times 20 = \underline{\quad}$$

$$\frac{3}{4} \times 12 = \underline{\quad}$$

$$\frac{5}{2} \times 20 = \underline{\quad}$$

Use ÷10 arrows to build an arrow road between the two numbers in each problem. Then complete the division fact.

31450
●

31.45
●

$31450 \div \boxed{} = 31.45$

570
●

0.057
●

$570 \div \boxed{} = 0.057$

3.15
●

0.315
●

$3.15 \div \boxed{} = 0.315$

273
●

27300
●

$27300 \div \boxed{} = 273$

Dil is a secret whole number.

Clue 1

is a positive divisor of   is less than

2   20

Dil

5   48
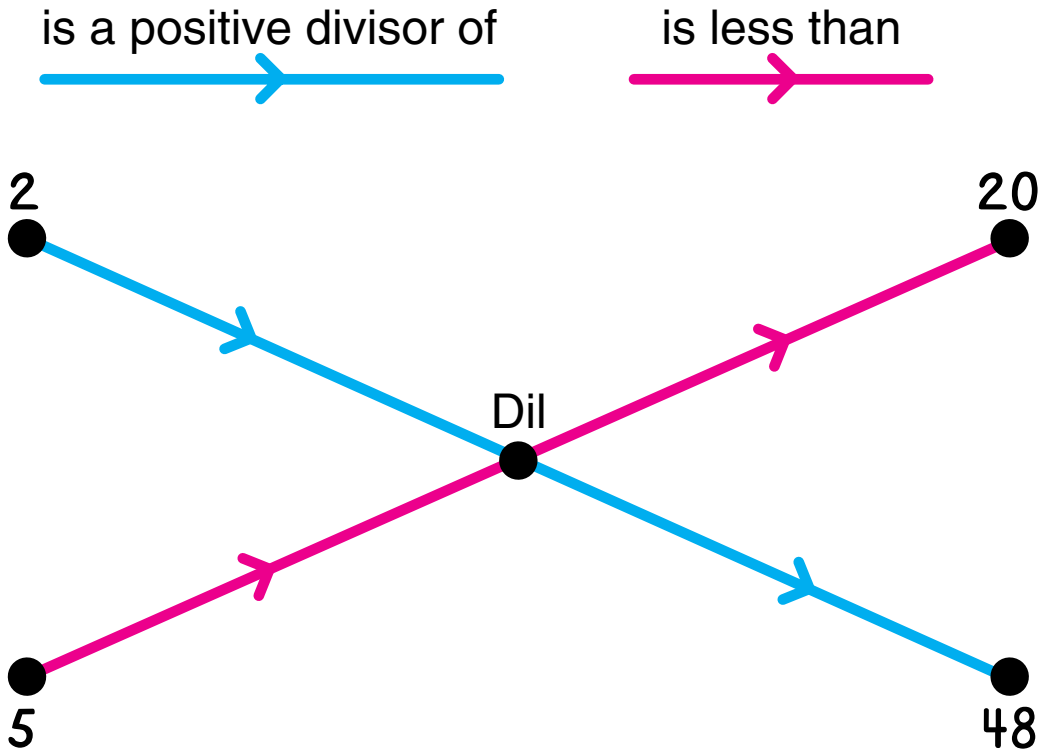
Dil could be _____, _____, _____, or _____.

Clue 2

The one-digit distance between 3 and Dil is not equal to 1.

$$d_1(3, \text{Dil}) \neq 1$$

Who is Dil? _____

Fill in the boxes with one-digit numbers.

$$\frac{1}{8} + \frac{1}{8} = \frac{\square}{8} = \frac{1}{\square}$$

$$\frac{1}{4} + \frac{1}{8} = \frac{\square}{\square}$$

$$\frac{3}{8} + \frac{1}{8} = \frac{\square}{8} = \frac{2}{\square} = \frac{\square}{2}$$

$$\frac{1}{2} + \frac{1}{8} = \frac{\square}{\square}$$

$$\frac{5}{8} + \frac{1}{8} = \frac{\square}{\square} = \frac{3}{\square}$$

$$\frac{3}{4} + \frac{1}{8} = \frac{\square}{\square}$$

$$\frac{7}{8} + \frac{1}{8} = \frac{\square}{\square} = \square$$

Complete.

$$\frac{1}{2} + \frac{3}{8} =$$

$$\frac{1}{4} + \frac{7}{8} =$$

$$\frac{5}{8} + \frac{1}{2} =$$

10

The Scouts are planning a 3-day camping trip for 18 people. The manual suggests they take 2 gallons of water for 4 people for 1 day. How much water should the Scouts plan to take?

_____

The 18 people taking the camping trip include adults. The Scouts agreed there should be 1 adult for every 5 youths. How many adults and how many youths are taking the trip? _____

Suppose the Scout leader decides they need 1 adult for every 3 youths. How many more adults would need to go? _____
How much more water would they need?_____

New York

Chicago

Los Angeles

SCALE: 1 cm = 250 km

1. Find the length of a line segment and the actual distance between each pair of cities.

	Line Segment	Actual Distance
Los Angeles – Chicago	_____ cm	_____ km
Chicago – New York	_____ cm	_____ km

2. If an airplane flies 400 km in one hour, what is the flying time from Los Angeles to Chicago? (Circle the closest answer.)

   3 hours   5 hours   7 hours   9 hours

   ... from Chicago to New York? (Circle the closest answer.)

   $1\frac{1}{4}$ hours $2\frac{3}{4}$ hours $3\frac{1}{2}$ hours $4\frac{1}{2}$ hours

3. The city, Truth or Consequences, is 1 000 km from Los Angeles and is in the United States. Using a compass, show in red the places where Truth or Consequences could be.

12

Fill in the boxes.

$$\widehat{5} \times 3 = \square \times \widehat{5} = \square$$

$$\square \times \widehat{5} = \widehat{3} \times 5 = \square$$

$$\widehat{3} \times 9 = \widehat{9} \times \square = \square$$

$$\widehat{6} \times \square = \widehat{5} \times \square = \widehat{30}$$

$$\widehat{6} \times \square = \widehat{5} \times \square = 30$$

$$4 \times \square = \square \times \widehat{7} = 28$$

Complete these two division calculations.

$$42 \overline{)12\,908}$$

$$67 \overline{)1\,553}$$

Fill in the box for the arrow.
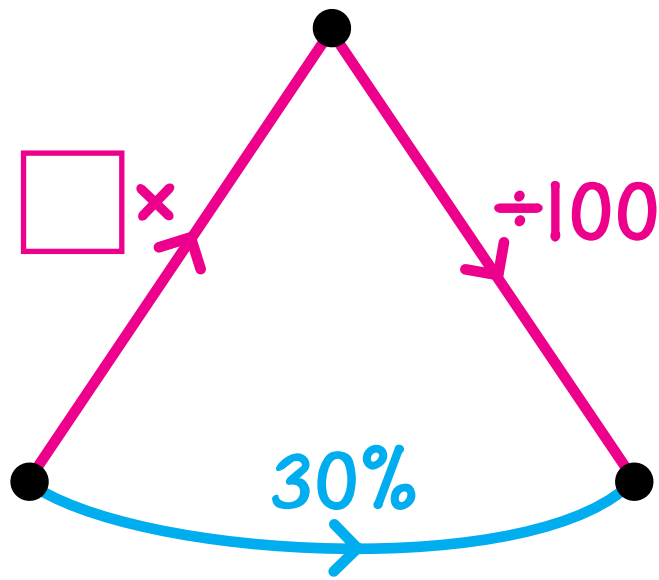
Complete.

30% of 60 = ☐

30% of 40 = ☐

30% of 30 = ☐

30% of ☐ = 21

30% of ☐ = 15

30% of ☐ = 30

Put each number on the Minicomputer by adding exactly one regular checker.

⑨ ⑦ = 742

⑦ ③ = 312

• • • = 5.6

⑤ ⑩ = 44.1

⑥ ② = 26

• ⑦ = 5.6

1. When a printer prints the page numbers of a 100-page book, how many "9"s are printed? _____

   When a printer prints the page numbers of a 1 000-page book, how many "9"s are printed? _____

2. Shawn and Vicki Rogers ran in the Tri-City Marathon. Shawn took 2 hours and 40 minutes to finish the race and Vicki took 2 hours and 57 minutes.
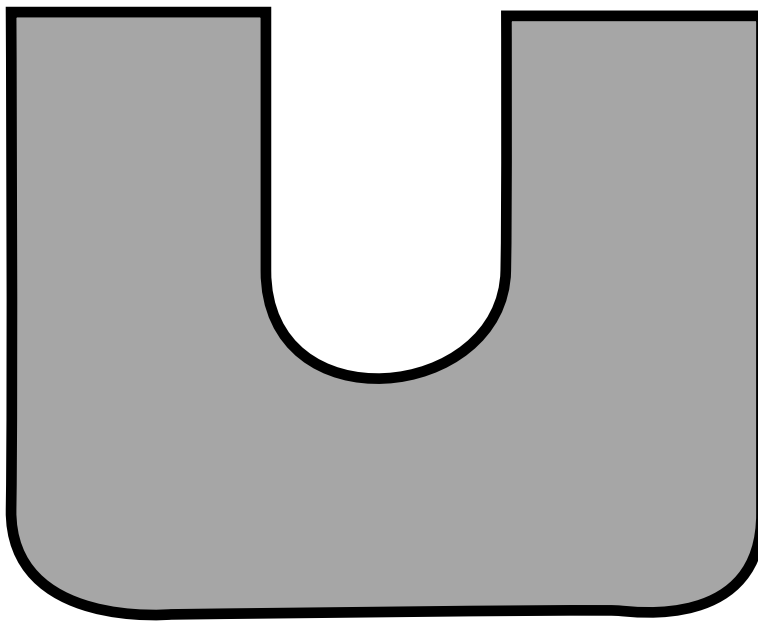
   If Shawn finished at 1:10 PM, at what time did he start? _____

   If Vicki started at the same time as Shawn, at what time did she finish? _____

Using one line, this shape is divided into <u>three</u> regions.
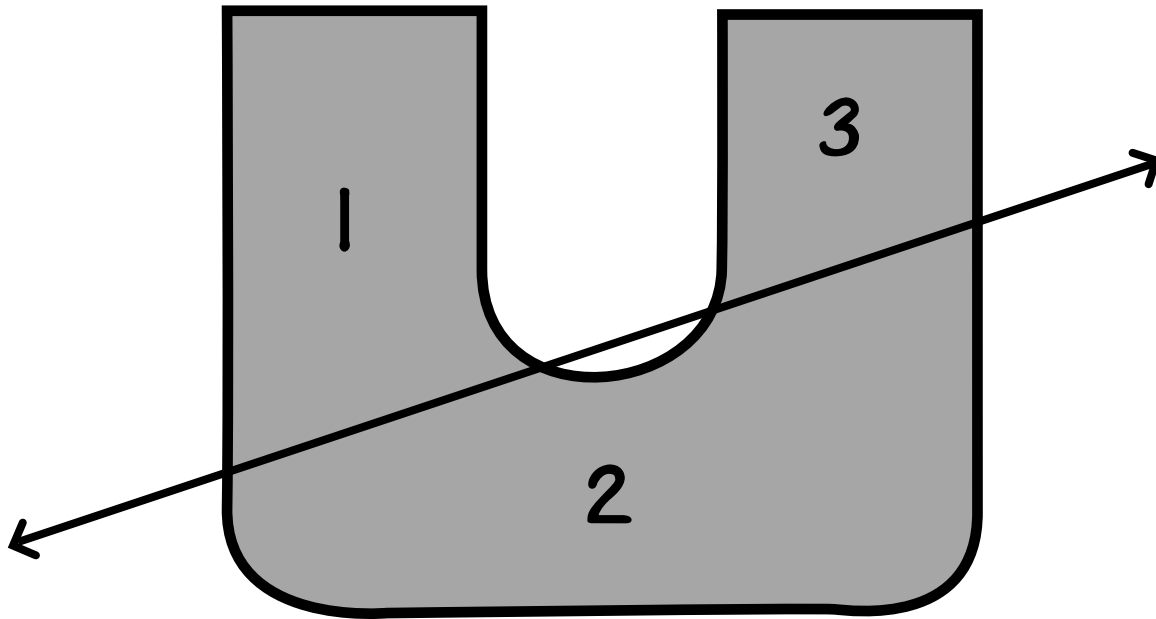
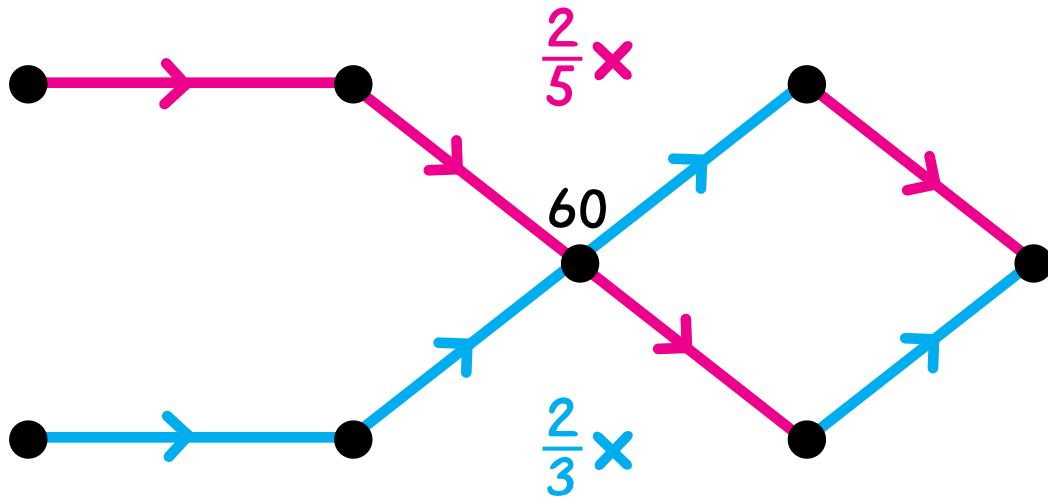Use two lines to divide this shape into <u>as many</u> regions as you can.

How many regions? _____

Wan is a secret number.

Wan is in this arrow picture.

In binary writing Wan is a seven-digit number.

What is Wan's binary name? _____

Who is Wan? _____

19

School Days

There are 180 school days in a year. If you attend a 50-minute math class every school day, how many hours do you spend in math class?
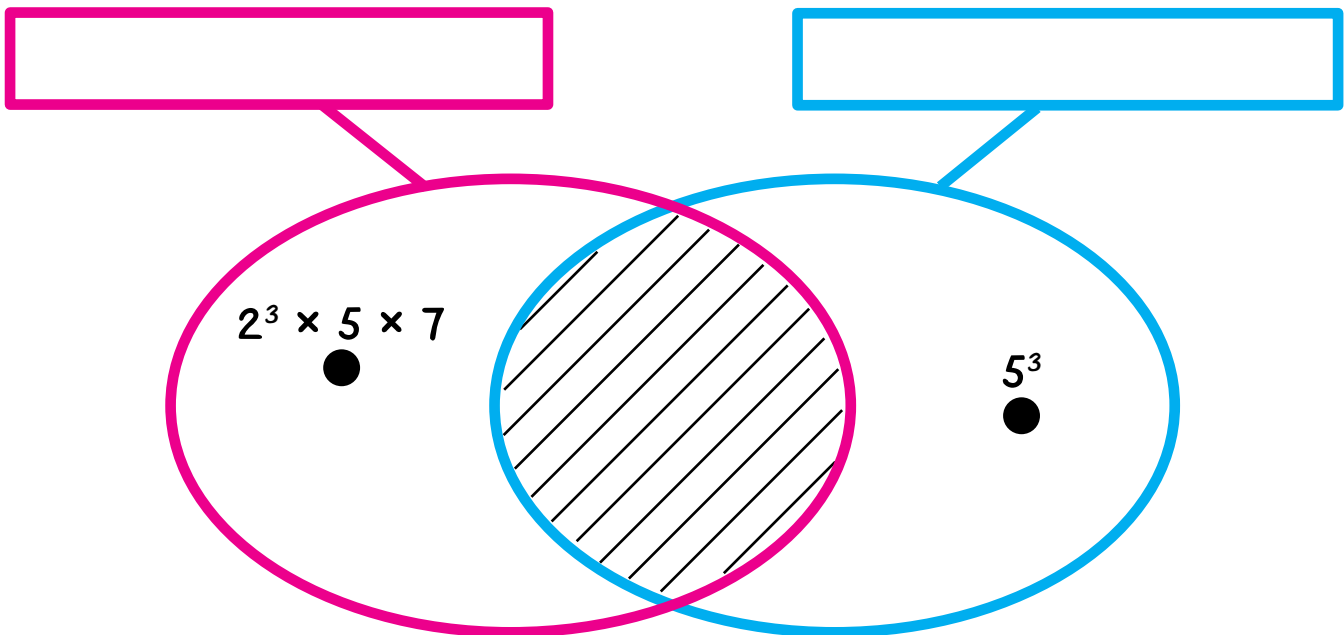
_____ hours

Show your work here.

The red label is one of these:

Multiples of 5
Multiples of 7
Odd numbers
Prime numbers
Multiples of 10
Multiples of 25

The blue label is one of these:

Multiples of 5
Multiples of 7
Odd numbers
Prime numbers
Multiples of 10
Multiples of 25

Label the strings.

$2^3 \times 5 \times 7$

5^3

After a burglary the police question three men: Archie, Gus, and Paul. The police know that exactly one of these men is guilty. The suspects make the following statements:

Archie: Gus did it.

Gus: Paul did it.

Paul: Archie lied when he said Gus did it.

If exactly one of these statements is false, who is the guilty man? _____

Whose statement is false? _____

Complete the calculations. Draw all the missing red arrows between the dots.

is less than

→

$$\frac{3}{4} + \frac{2}{5} = \underline{\qquad}$$
●

$$\frac{3}{4} - \frac{2}{5} = \underline{\qquad}$$
●

●
$$\frac{3}{4} \times \frac{2}{5} = \underline{\qquad}$$

●
$$\frac{3}{4} \div \frac{2}{5} = \underline{\qquad}$$

23

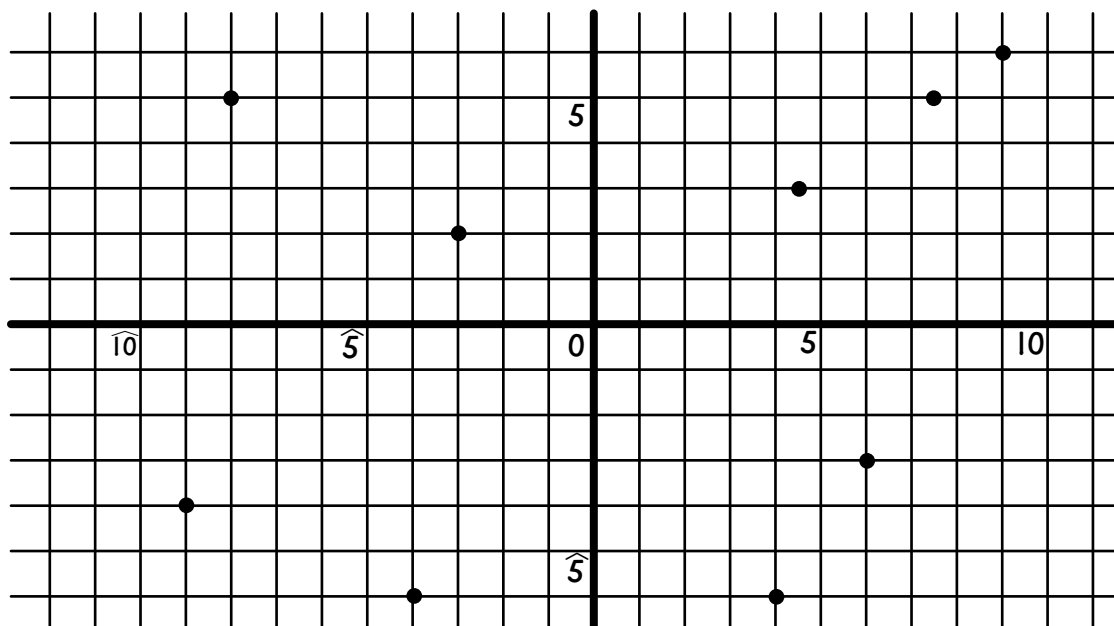Use three lines to divide this shape into as many regions as you can.
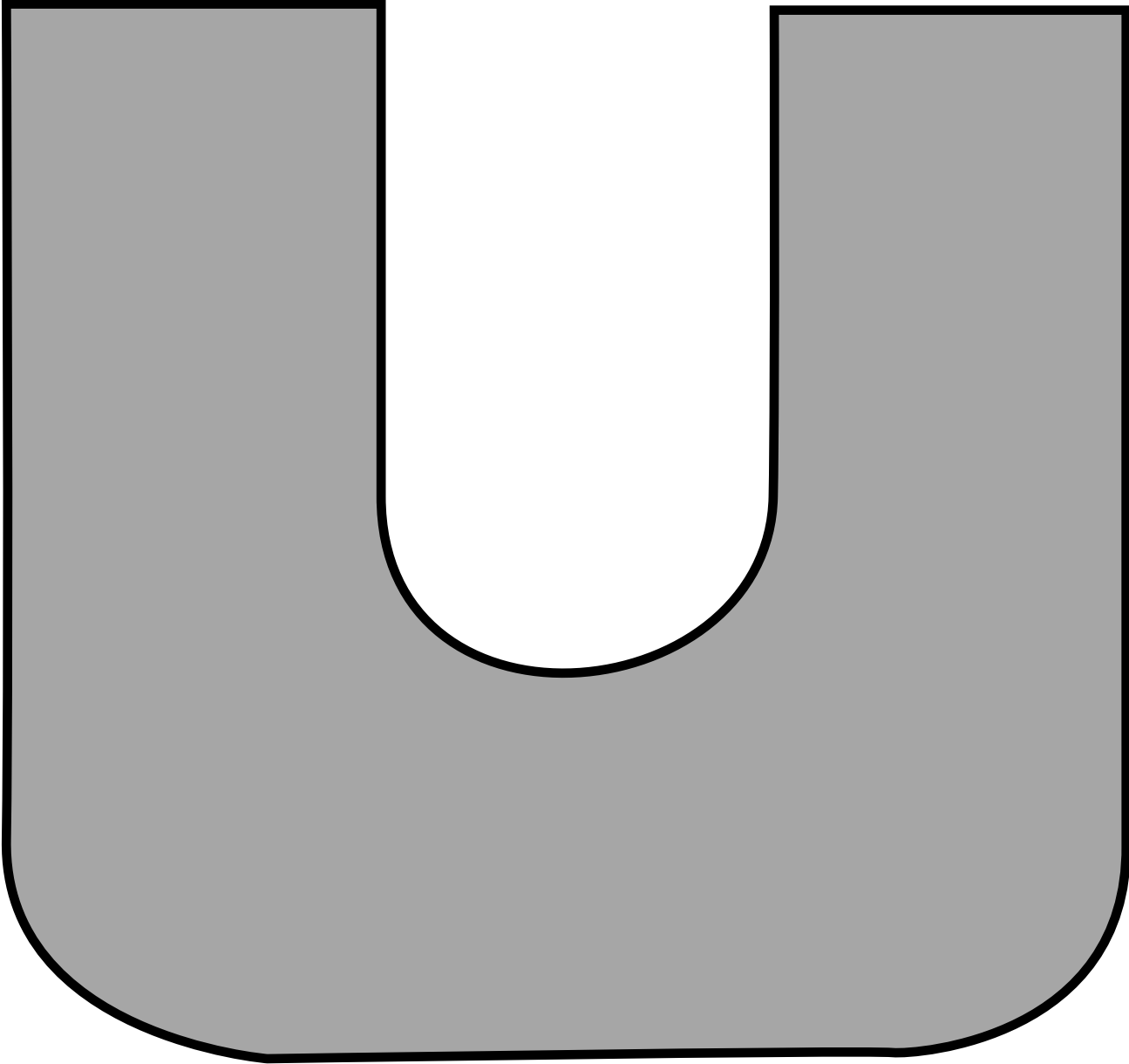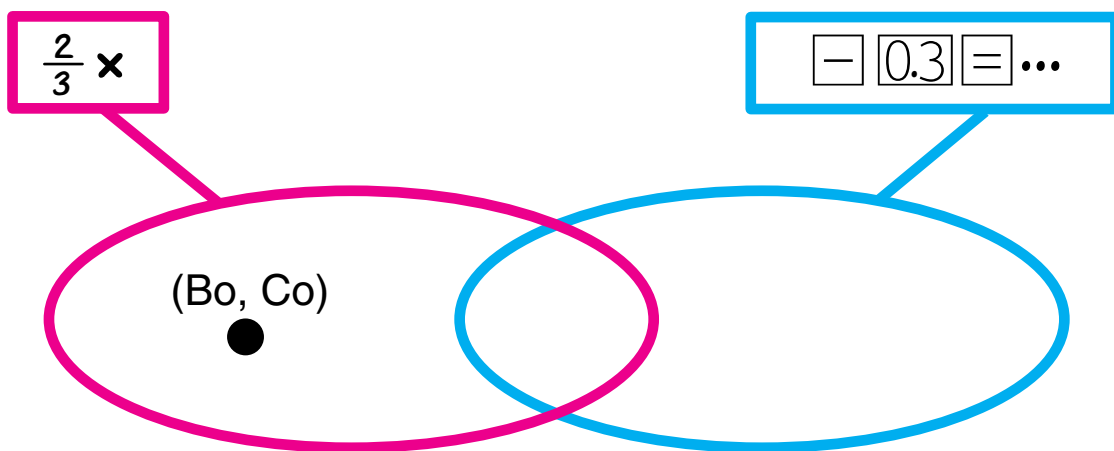

How many regions? _____

Bo and Co are secret numbers.

(Bo, Co) is one of the dots on this grid.

$\frac{2}{3}$ ×

$-$ 0.3 $=$ ⋯

(Bo, Co)

(Bo, Co) is (_____, _____).

Label the dots. One of the numbers has two names listed.
Write both names for that number beside its dot.

$$\frac{2}{3} \div \frac{1}{2}$$

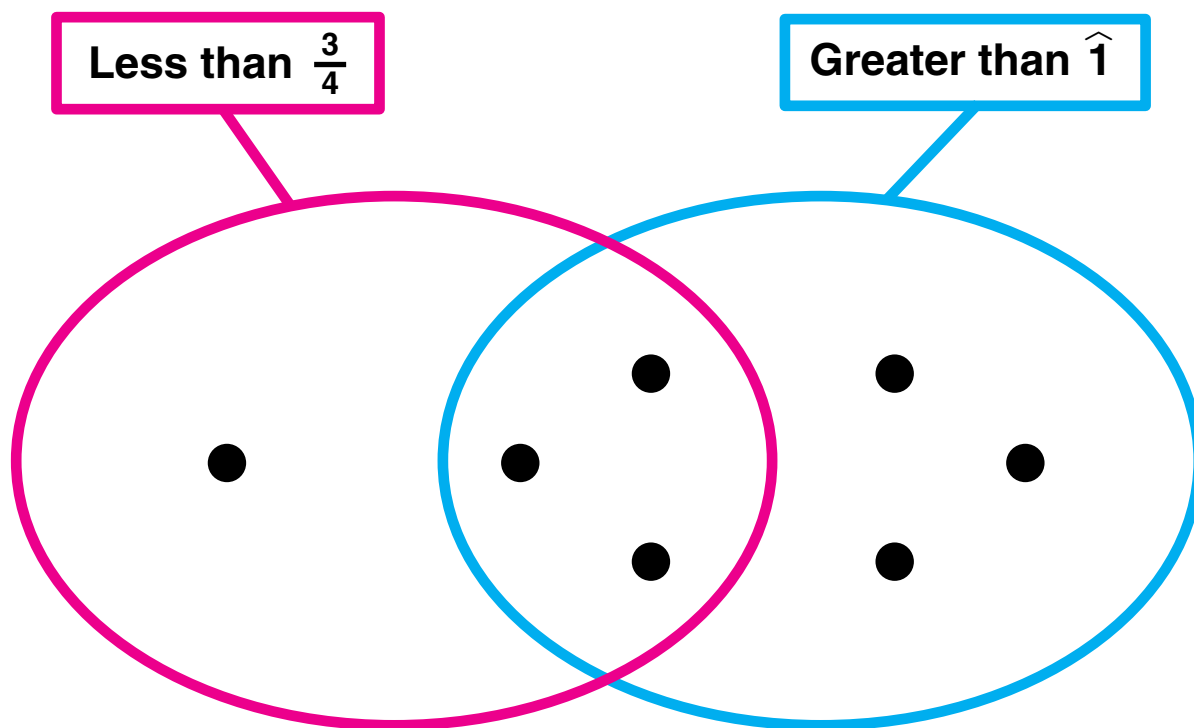$$\frac{\widehat{3}}{2} + \frac{2}{3}$$

$$0.5 \times 2.2$$

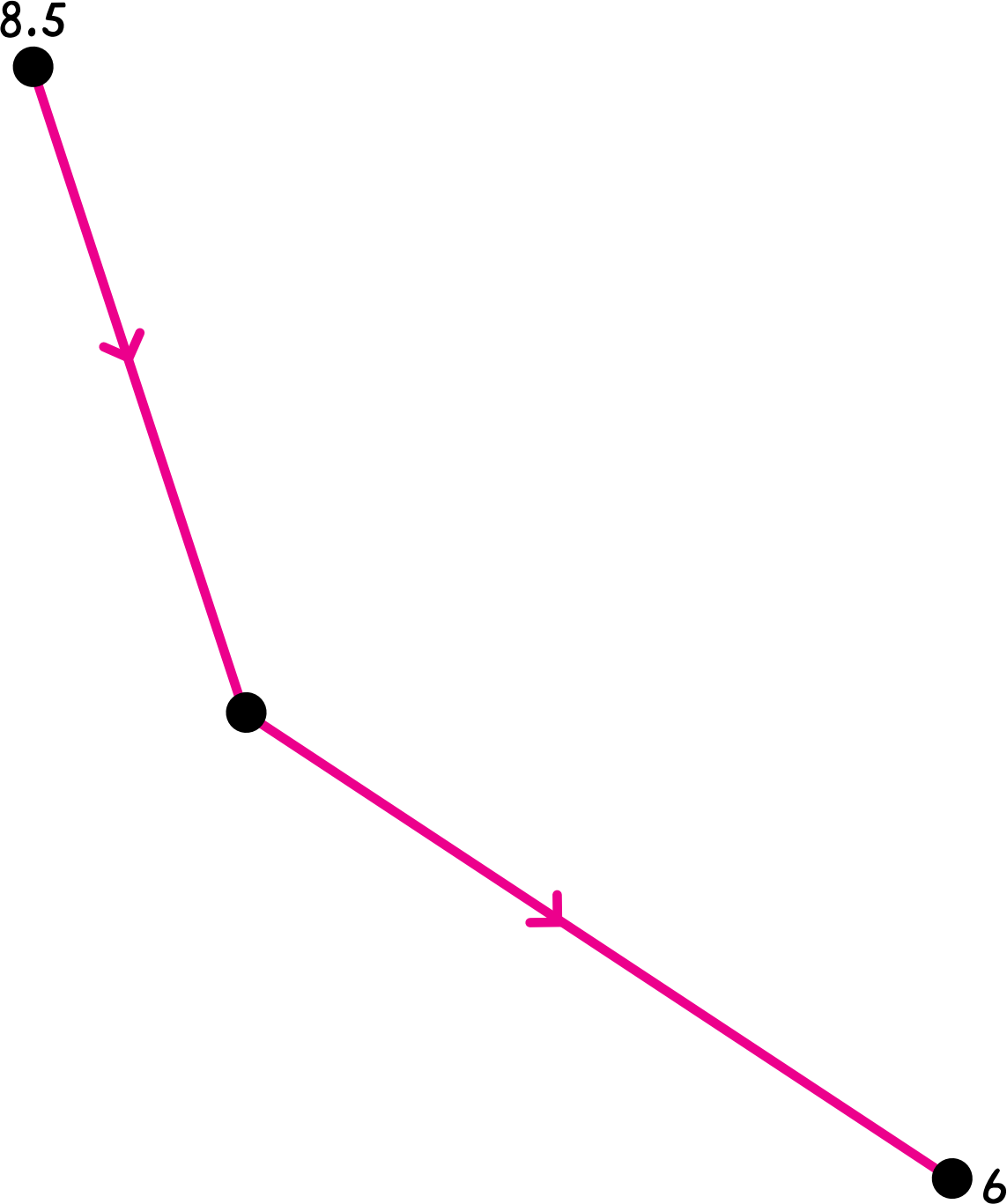$$1.56 - 0.89$$

$$\frac{1}{6} \div \frac{1}{5}$$
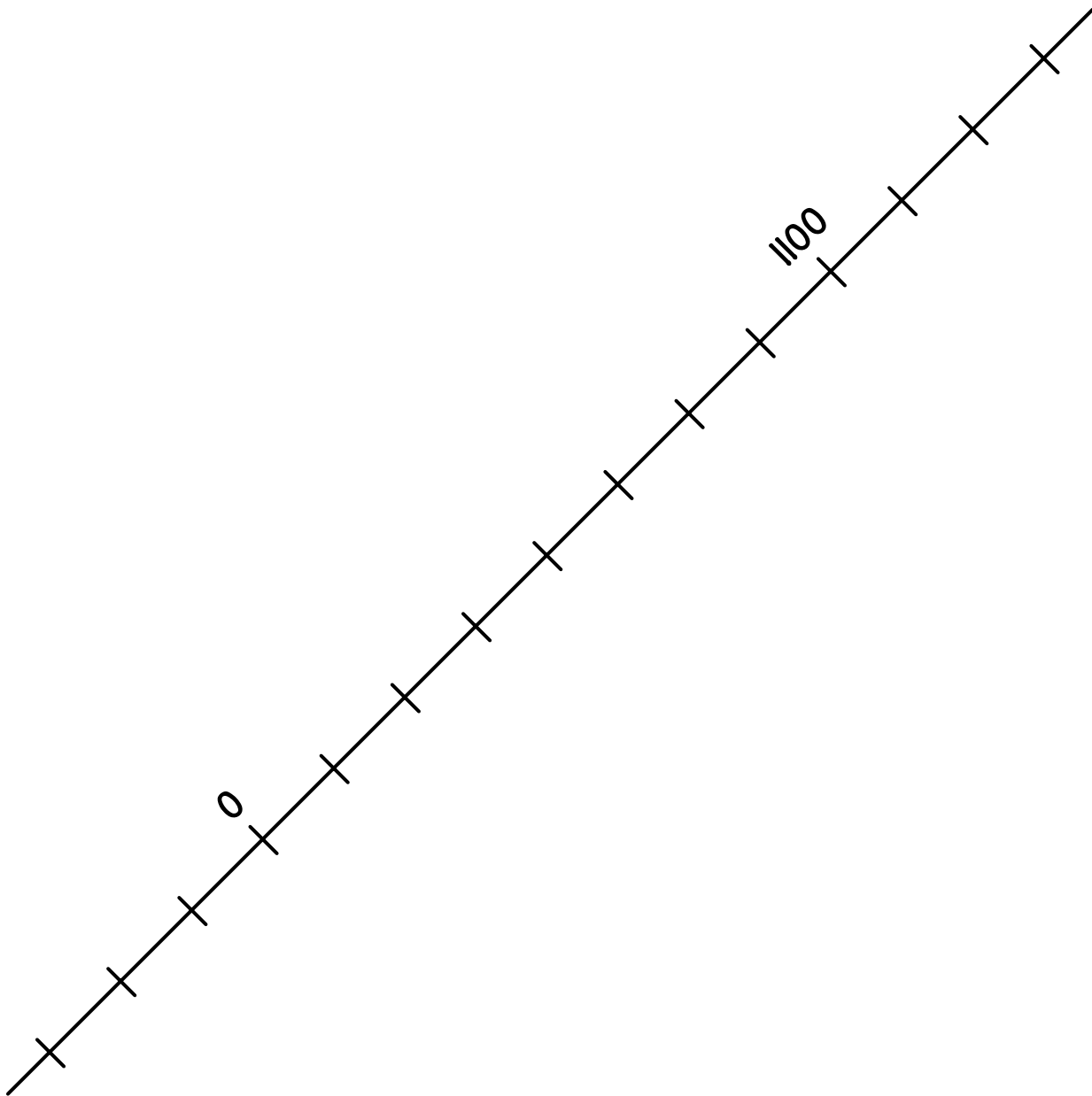
$$\frac{1}{6} \div 1$$

$$\frac{2}{5} - \frac{3}{2}$$

$$\frac{4}{7} \times \frac{7}{3}$$

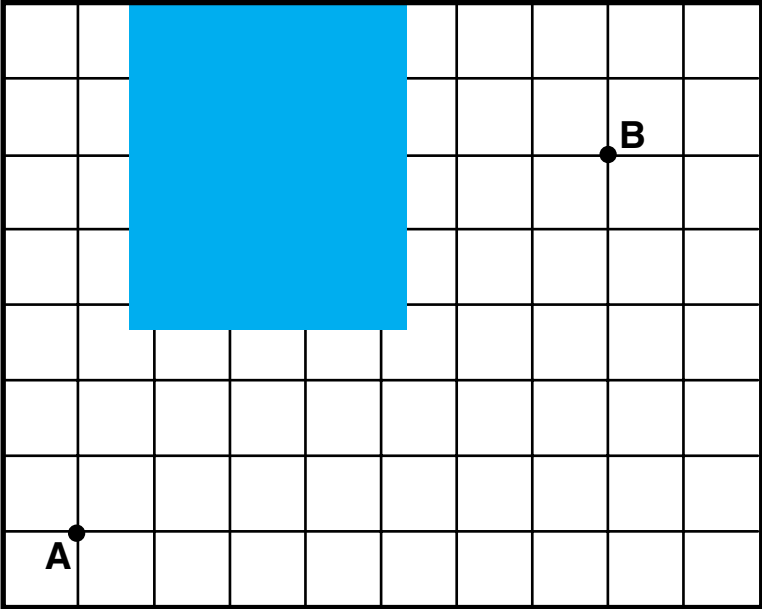**Less than $\frac{3}{4}$**

Greater than $\widehat{1}$

Build a road from 8.5 to 6 with <u>exactly two</u> arrows. Each arrow must be for **+**, **−**, **×**, or **÷** a one-digit whole number.

8.5

6

Label this number line in the binary code.

The number line has tick marks with labels "0" and "1100" marked.
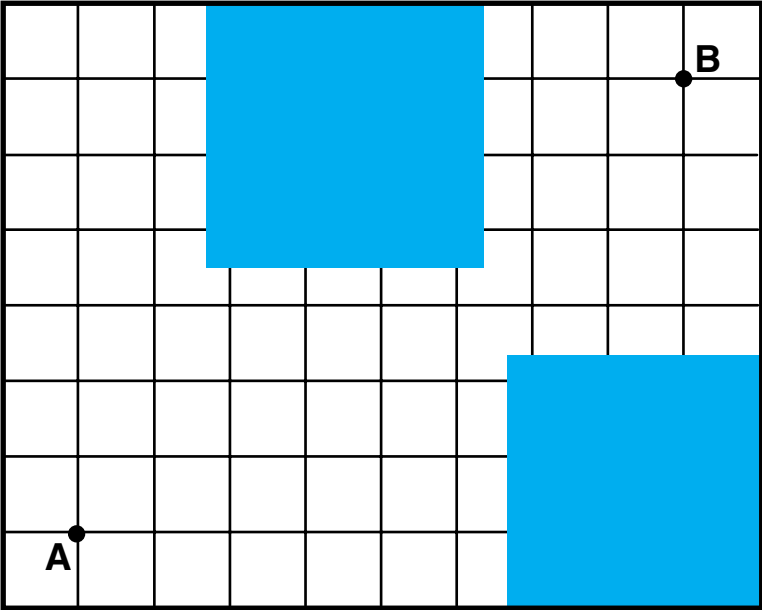
How many shortest routes from **A** to **B**.
Note: Routes must follow grid lines and may not go through the shaded areas.

B

A

_____

B

A

_____

29

Use a piece of scratch paper to make a square corner (right angle). Then construct a six-sided shape with exactly one obtuse and one acute angle.

$$a \longrightarrow (a - 3)^2$$

Fill in the blanks. Each ordered pair belongs to the red relation. One is done for you.
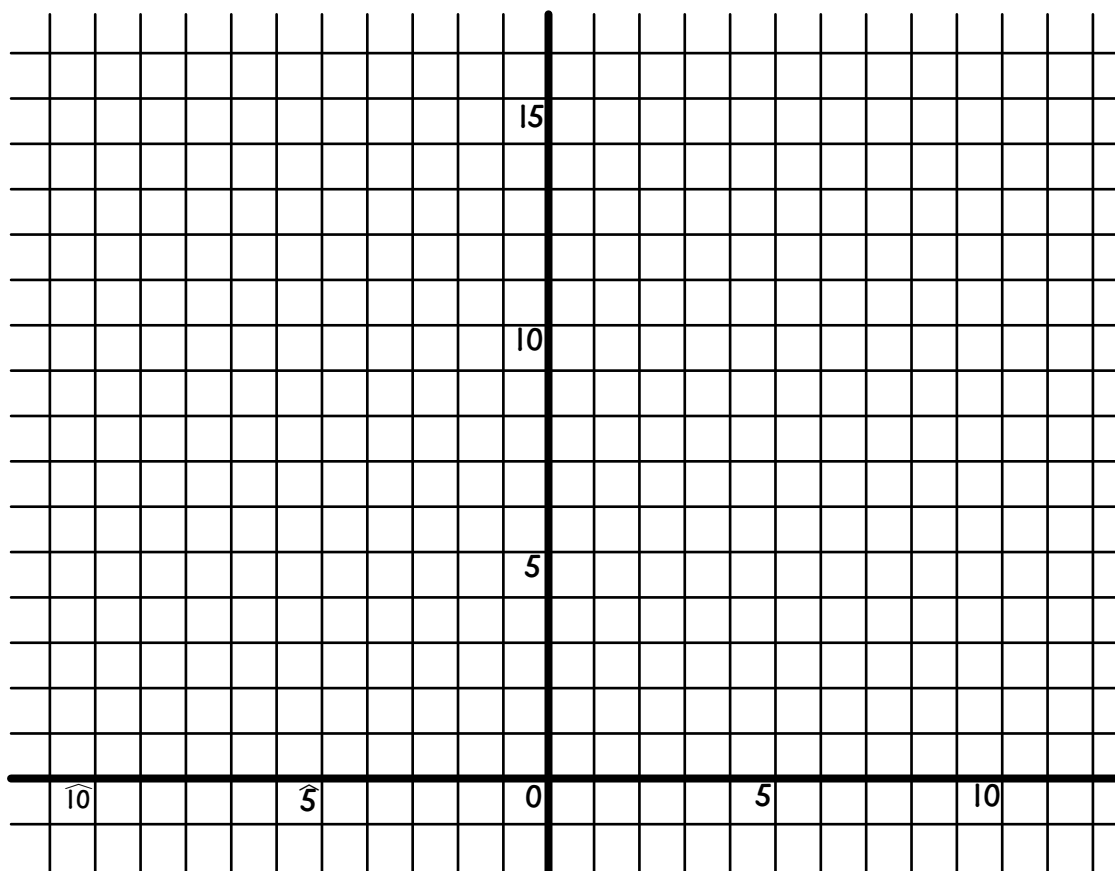
(5, 4)   (7, __)   (2, __)

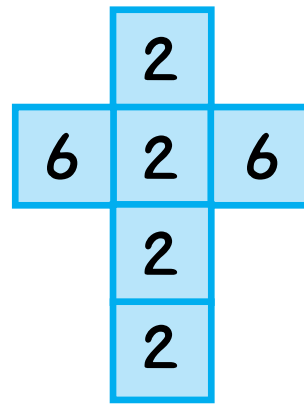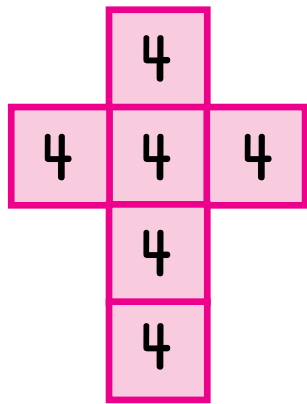($\widehat{1}$, __)   ($3\frac{2}{3}$, __)   ($\frac{9}{2}$, __)

For each ordered pair, draw a dot on the grid. Sketch the Cartesian graph for this relation.

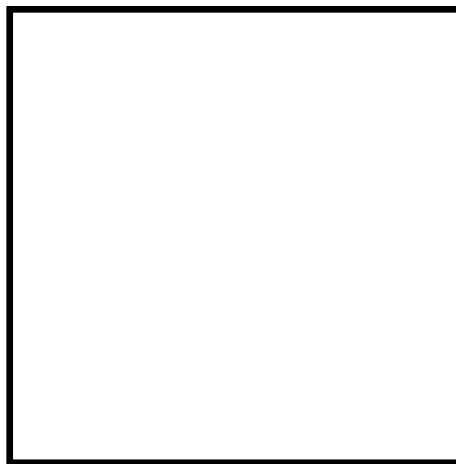Name two more ordered pairs that belong in the red relation.

(_____ , _____) and (_____ , _____)

31

These are the maps of two number cubes.

	4		
4	4	4	
	4		
	4		

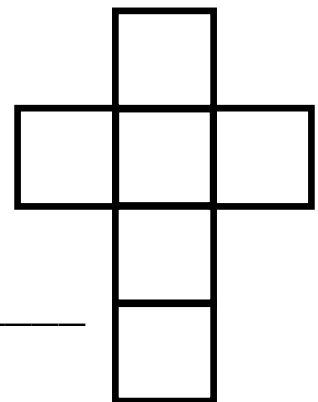|	2		
6	2	6	
	2		
	2		

Roger rolls the red cube and Beth rolls the blue cube. Use this square to calculate the probability that Roger wins by rolling the higher number.

● Roger wins

● Beth wins

What is Roger's probability of winning over Beth? _____

Using only the numbers 1, 3, and 5, label this cube for Erin so that Erin is favored over Roger, but Beth is favored over Erin.

What is Erin's probability of beating Roger? _____

What is Beth's probability of beating Erin? _____