



# YEAR SEVEN EXAM PRACTICE

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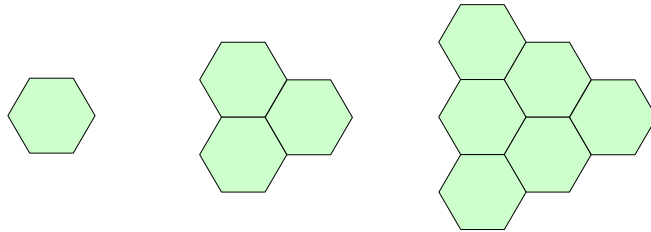


## Sequences

1 Write the next three terms in this sequence.

23 31 39 47 ..... .....

2 a Describe what is happening in this sequence.



b Draw the next term in the sequence.

3 Tick the linear sequences below.

12, 15, 18, 21

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

12, 12, 24, 36

7, -2, -11, -20

4 What is the nth term of the following linear sequence?

24, 18, 12, 6, ...

- 5 What are next three terms in this linear sequence?

$$12\frac{1}{2}, 15\frac{3}{4}, 19, \dots, \dots, \dots$$

- 6 What are the next three terms in this non-linear sequence?

$$6 \quad 10 \quad 15 \quad 21 \quad 28$$

- 7 Billy thinks of a number. The number of which he thinks is 12. He uses the factors of his number to come up with the following sequence.

$$1 \quad 2 \quad 4 \quad 7 \quad 11 \quad 17 \quad 29$$

Joanne uses the same rule as Billy but thinks of the number 16. What sequence would Joanne write down?

- 8 A sequence starts with the following numbers:

$$1, 7, 13, 19, 25$$

Is the number 6937 in this sequence?

## Algebraic Notation

- 1 Complete the following equations

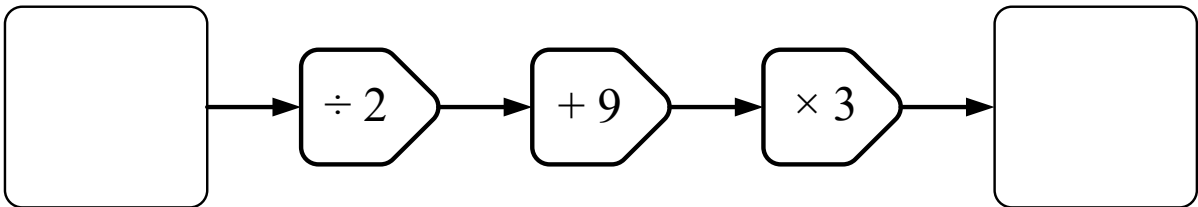
$$x + x + x + x =$$

$$3x + 5y + 2x - 6y + x =$$

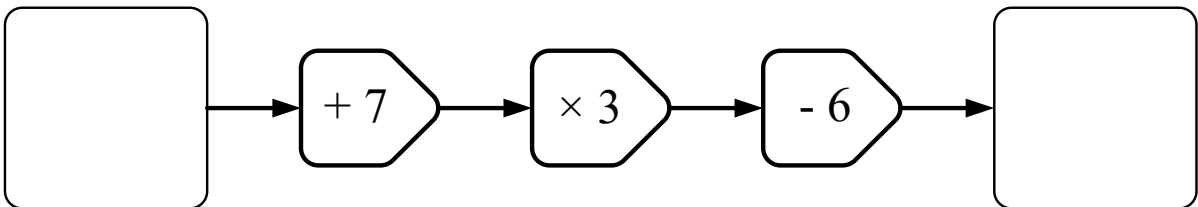
$$4x \times x =$$

$$3x \times 5x =$$

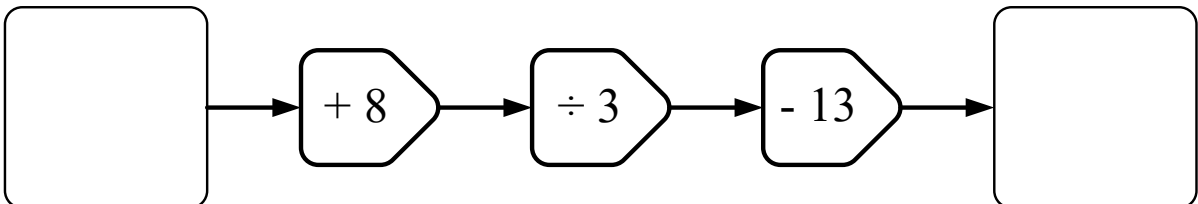
- 2 What is the output in this number machine if the input is 8?



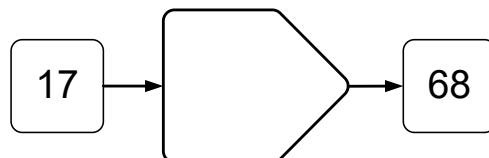
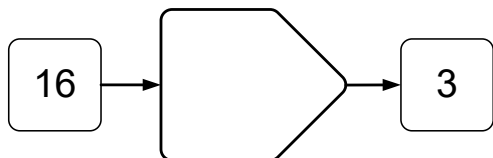
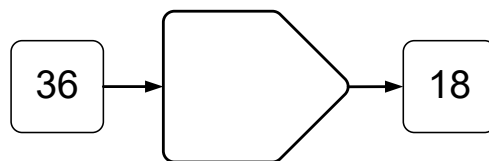
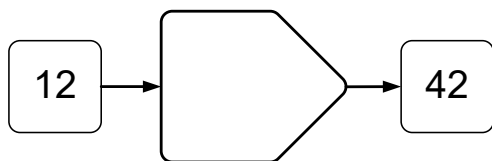
- 3 What input is sent into this number machine if the output is 24?



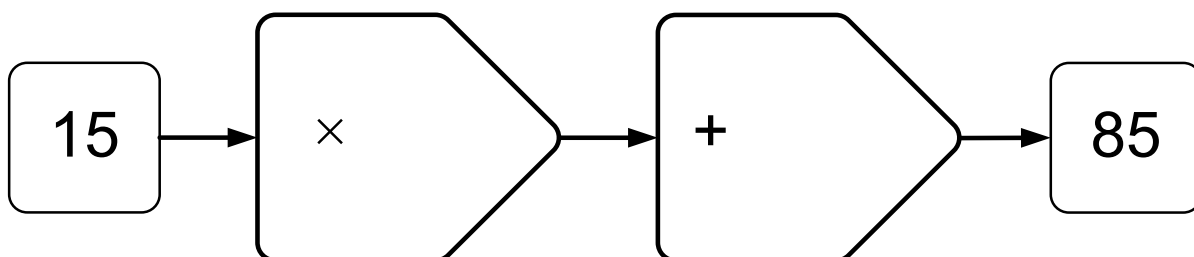
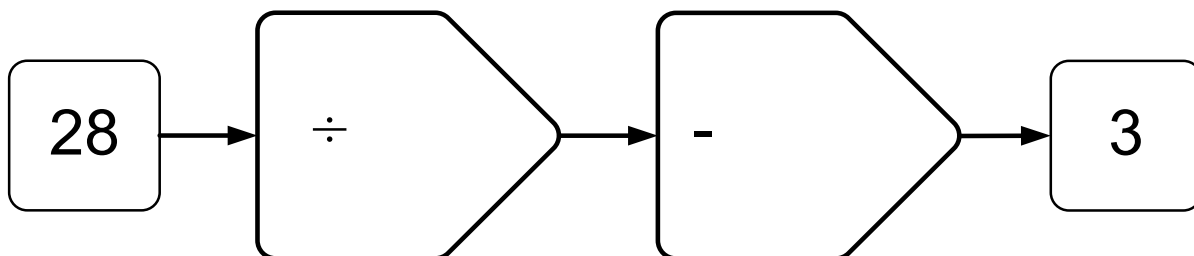
- 4 What is the output of this function machine if the input is  $x$ ?



- 5 Fill in the missing functions on the function machines below to turn the given input into the correct output. You must use all four number operations, (+, -, × or ÷) once each.



- 6 Fill in the correct terms using the operations provided to achieve the desired result.



- 7 When we use formulae, we substitute values for letters. Substitute the following values into the equation given below to find the value of  $s$ .

$$t = 12 \text{ seconds}, u = 25 \text{ ms}^{-1}, a = 9 \text{ ms}^{-2}$$

$$s = ut + \frac{1}{2} at^2$$

## Expressions and Equations

- 1 Simplify the following to find the value of x.

$$3x = 18$$

$$x + 7 = 38$$

$$\frac{x}{4} = 9$$

$$x - 12 = 9$$

- 2 Solve the following two and three step equations to find the value of x.

$$5x - 8 = 62$$

$$\frac{x + 5}{3} = 4$$

$$\frac{12x - 8}{5} = 8$$

- 3 Expand, simplify and solve.

$$5(3x + 2) = 115$$

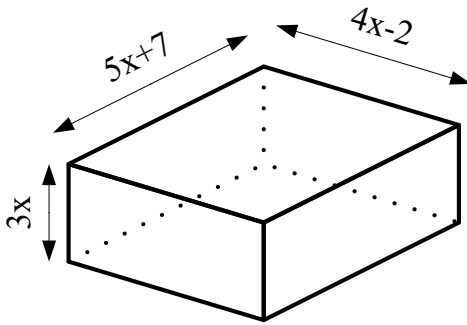
$$8(3x + 2) - 5(6x - 9) = 37$$

$$\frac{4(3x + 7)}{2} - 21 = 5$$

- 4 Expand and simplify the following expression.

$$(4x - 7)(3x + 2)$$

- 5 The cuboid below has the sides as shown. Derive an expression for the volume of the cuboid.



- 6 Factorise  $24x^2 + 8x - 4x^3$

## Place Value, Ordering and Rounding

- Write the number 352,078 in words
- Write the number seven hundred and eight thousand, four hundred and thirty-one point eight four nine in figures.

- Put the following numbers into ascending order.

3, 12, -5, 8, -7

- Put the following numbers into ascending order.

$\frac{1}{2}$ , 0.47, 52%,  $\frac{4}{7}$ , 0.58, 0.61%

- What is the value of the 7 in the number 0.381734?

- Use the <, = or > symbols to make this true.

$$12 \bigcirc 17$$

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

$$-6 \bigcirc -5.5$$

$$\frac{-6}{7} \bigcirc \frac{-7}{8}$$

$$0.71 \bigcirc 0.701$$

$$-0.8 \bigcirc -0.804$$

- 7 Estimate  $\frac{68 \times 84 \times 94}{44 \times 67 \times 89}$ .
- 8 Write 12345 as a number in standard form.
- 9 Write 0.0084 as a number in standard form.
- 10 Write  $7.2 \times 10^7$  in ordinary form.
- 11 Billy writes 84,928,000 in standard form. He writes  $84.928 \times 10^3$ . Is Billy correct? How can you tell?
- 12 Find the solution to the following problem. Give your answer in standard form.

$$\frac{6.2 \times 10^5 \times 7.8 \times 10^2}{3.2 \times 10^4 \times 3.9 \times 10^0}$$

## Four Operations

1  $24 + 35 + 307 + 3.928 + 93.81$

2  $16.521 \times 2.9$

3  $4827 - 93.038$

4  $29,471.61 \div 7.4$

- 5 Put the brackets in the correct place to make each of the following statements true.

$$84 \div 12 + 6 - 24 \div 4 \times 6 = 0$$

$$84 \div 12 + 6 - 24 \div 4 \times 6 = -21$$

- 6 Find the solution to each of the following.

$$\frac{5}{6} + \frac{6}{7} =$$

$$\frac{1}{2} \times 3\frac{2}{5} =$$

$$\frac{3}{4} \div \frac{4}{9} =$$

$$5\frac{2}{3} - 1\frac{3}{4} =$$

## Averages and Range

1 Look at the data below and determine the mode, median, average and range.

24      41      41      25      23      15      5      63      41

Mode = .....

Mean = .....

Median = .....

Range = .....

2 Look at the data below and determine the mode, median, average and range.

$\frac{3}{4}$     40%    0.5     $\frac{1}{2}$     65%    0.7     $\frac{3}{5}$     80%

Mode = .....

Mean = .....

Median = .....

Range = .....

- 3 Billy thinks of six numbers. Five of his numbers are 5, 5, 4, 6, 7.  
The mode of all Billy's numbers is 5. The median of his numbers is 5.5 and the mean of his numbers is 9.
- a What is Billy's sixth number?

b What is the range of his numbers?

- 4 Florence thinks of a number. When added to the following set of numbers, the mode becomes 12; the mean becomes 6.5 and the median becomes 7.5.

4 5 6 9 10 12 12

a What is the final number in Florence's sequence?

b What is the range of Florence's set of numbers?

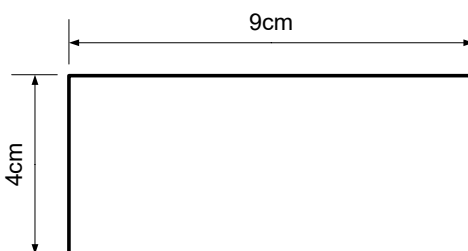
- 4 Put the following data into an ordered stem and leaf diagram.

3.4 2.6 4.3 3.7 3.9 4.1 4.4 4.6 2.4 2.7 3.6 3.7

Identify the median.

## Rounding and Estimation

- 1 Round the following to one significant figure.
  - a. 46
  - b. 462
  - c. 839
  - d. 0.43
  - e. 0.783
  - f. 0.89332
  - g. 3.42
  - h. 5.56
  - i. 7.59
  - j. 0.000382
  
- 2 Round the following to two significant figures.
  - a. 38.948
  - b. 1.948
  - c. 0.048
  - d. 0.3928
  - e. 0.000392
  - f. 0.003829
  - g. 0.00003
  - h. 4029.0028
  - i. 0.0000005
  - j. 0.0409382
  
- 3 Pheobe rounded her figures to the nearest hundredth. Write the error interval for each of the following numbers.
  - a. 45.04
  - b. 7.39
  - c. 8.54
  - d. 9.00
  - e. 48.91
  - f. 52.93
  
- 4 The rectangle below has all its dimensions rounded to the nearest centimetre.
  - a Find the error interval of the area of the rectangle.
  - b Find the error interval of the perimeter of the rectangle.



- 5 Harrison cycles 40km (rounded to the nearest 5 km) in 2 hours (rounded to the nearest hour). Give the error interval of Harrison's speed.

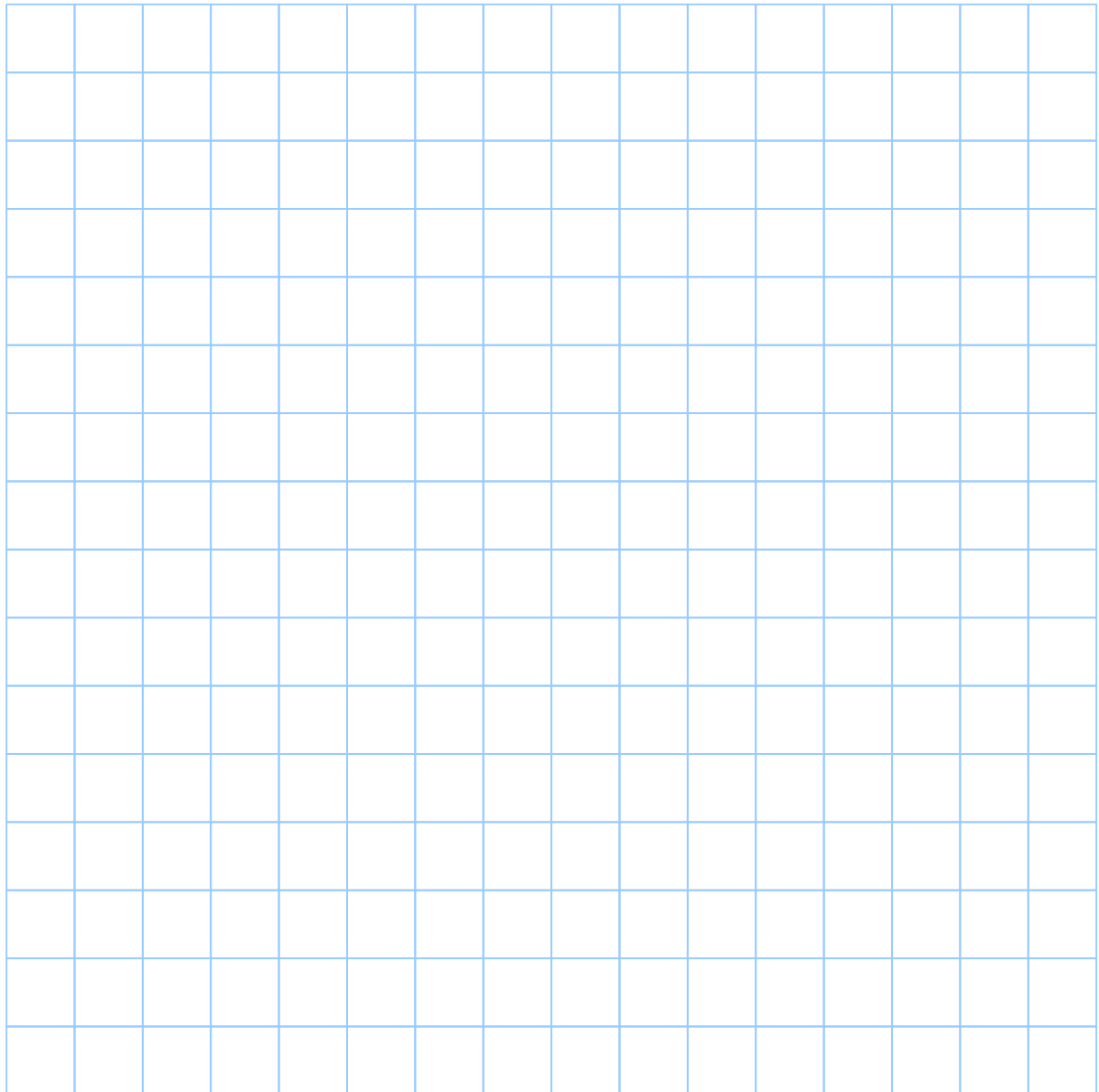
Remember that  $Speed = \frac{Distance}{Time}$

- 6 Given that  $density, \rho = \frac{mass, m}{volume, v}$ , find the error interval of the density of the following object.  
The object had a mass of 7400g (rounded to the nearest 100g) and a volume of  $36\text{cm}^3$  (rounded to the nearest  $\text{cm}^3$ ).

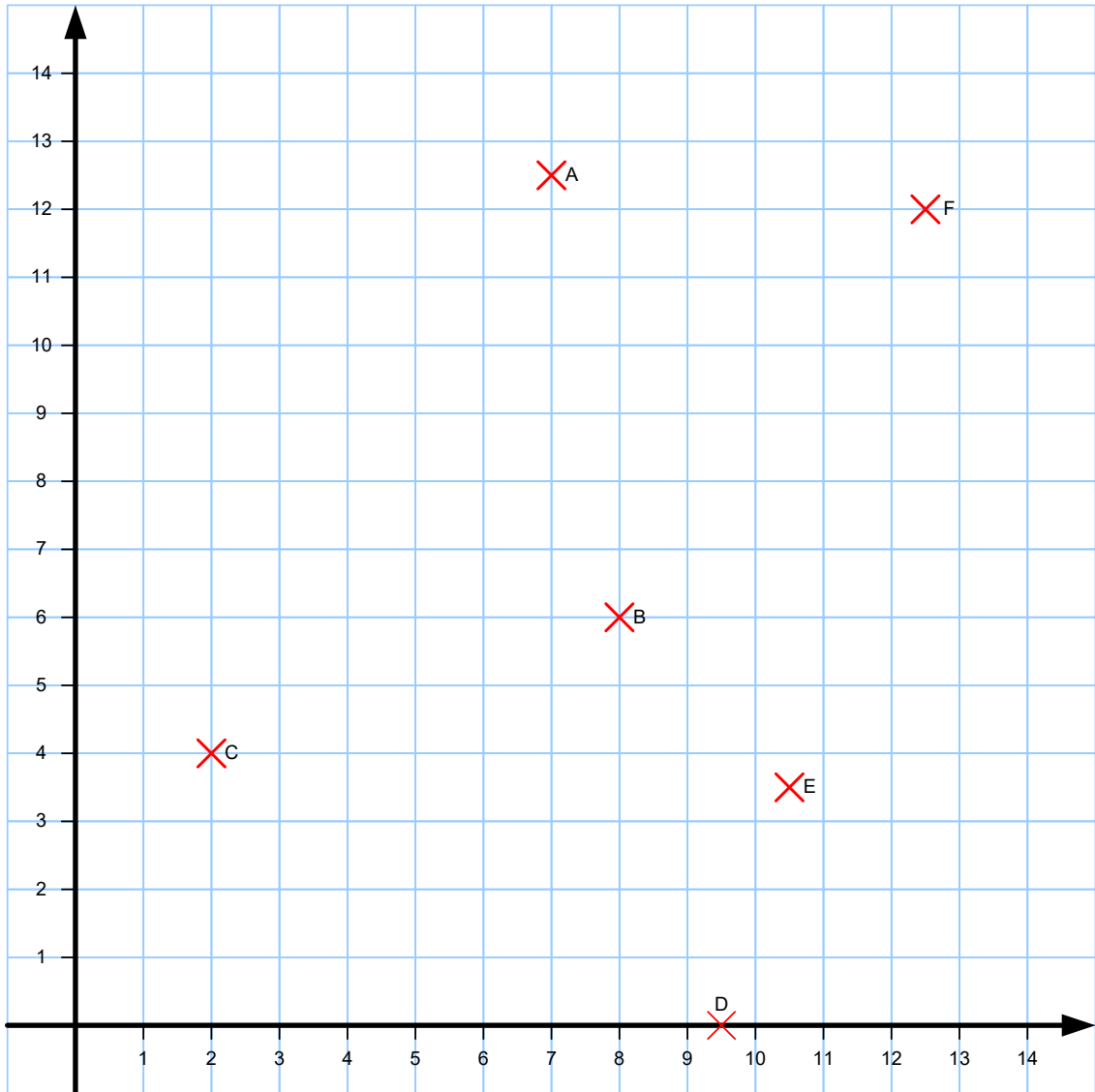
## Graphing Data

- 1 Below is some data showing number of people in Years Seven and Eight who like different sports. Draw a suitable data display to show this information.

Sport	Year Seven	Year Eight
Cricket	12	15
Football	24	22
Netball	18	19
Rounders	17	19
Rugby	21	22



2 Write the coordinates of the following points.



A .....

B .....

C .....

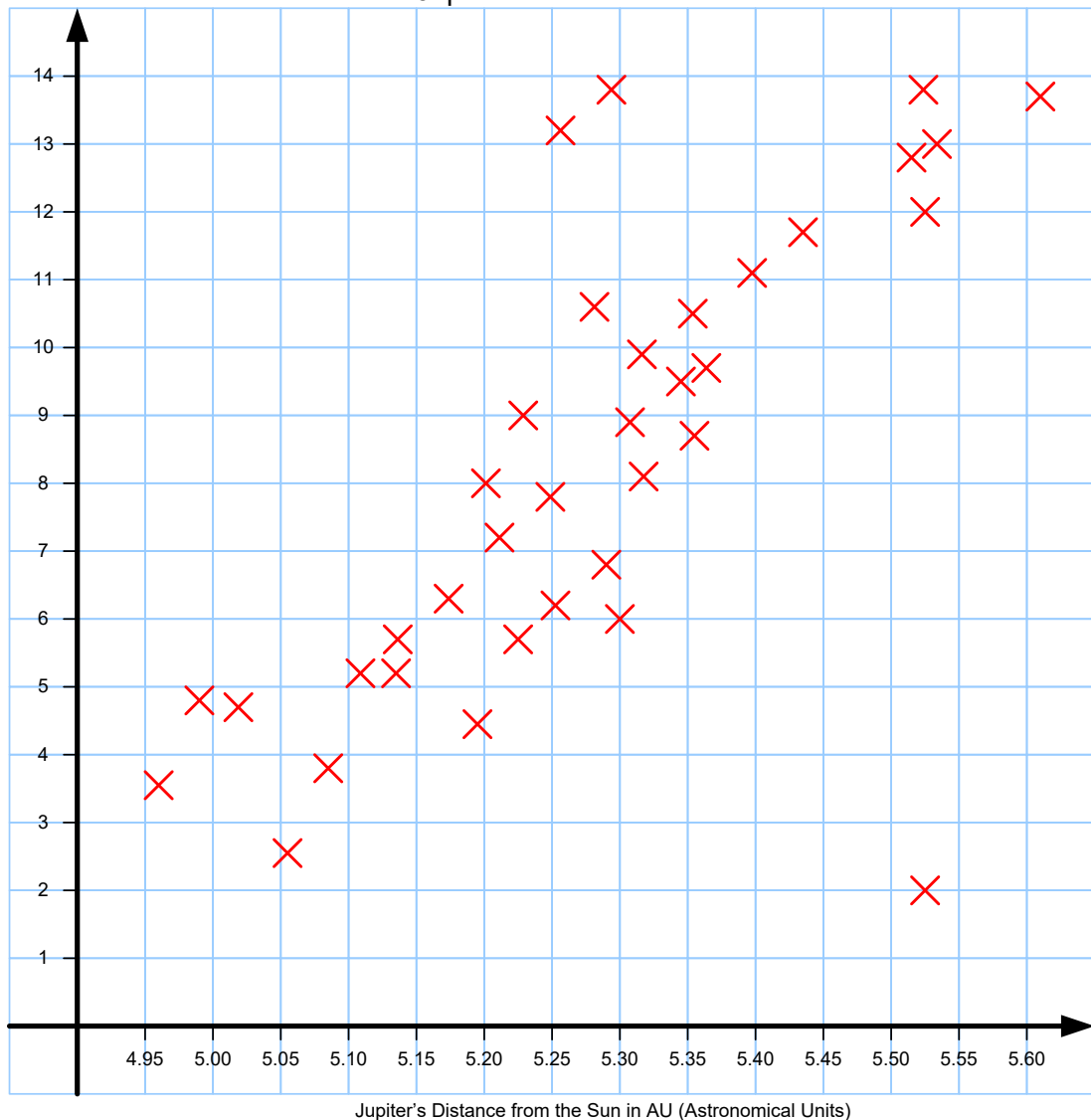
D .....

E .....

F .....

- 3 Below is a scatter graph comparing the astronomical distance of Jupiter from the Sun with the number of professional secretaries employed in Alaska, USA.

A Scatter Graph Comparing the Number of Professional Secretaries in Alaska with Jupiter's Distance from the Sun.



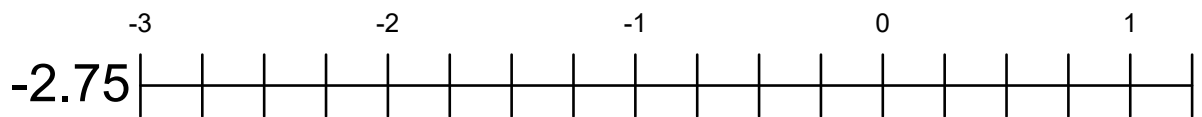
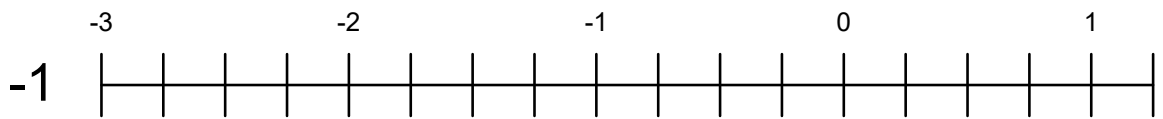
- a Draw a line of best fit on the scatter graph.
- b How many secretaries should be in employment in Alaska when Jupiter is 5.455 AU from the sun?
- c Describe the type of correlation that this information suggests.
- d Billy says that, "This is proof that Jupiter is affecting the number of secretaries employed in Alaska." Comment on the conclusion that Billy has drawn from this data.

## Fractions, Decimals and Percentages

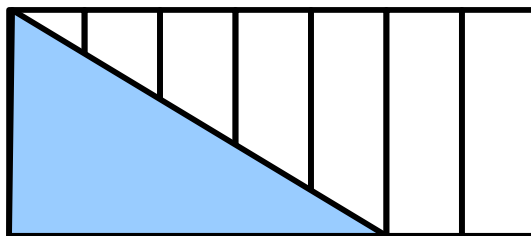
- 1 Fill in the table below with the equivalent amounts. Give the fraction in its simplest form.

Fraction	Decimal	Percentage
$\frac{3}{4}$		
	0.5	
		72%
$\frac{4}{5}$		
	0.85	
$\frac{5}{8}$		
		65%
$\frac{13}{8}$		
	2.76	
		98%
$\frac{3}{20}$		

- 2 Draw an arrow indicating the position of the value given on the number line.

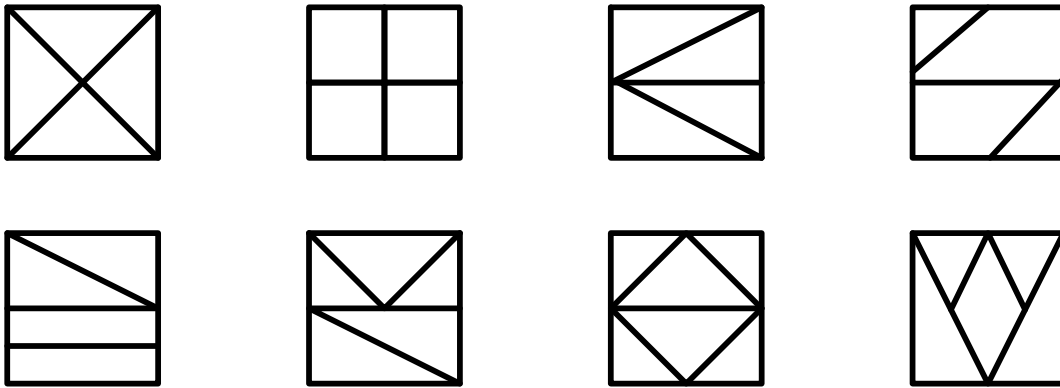


- 3 What fraction of the shape below is shaded blue?

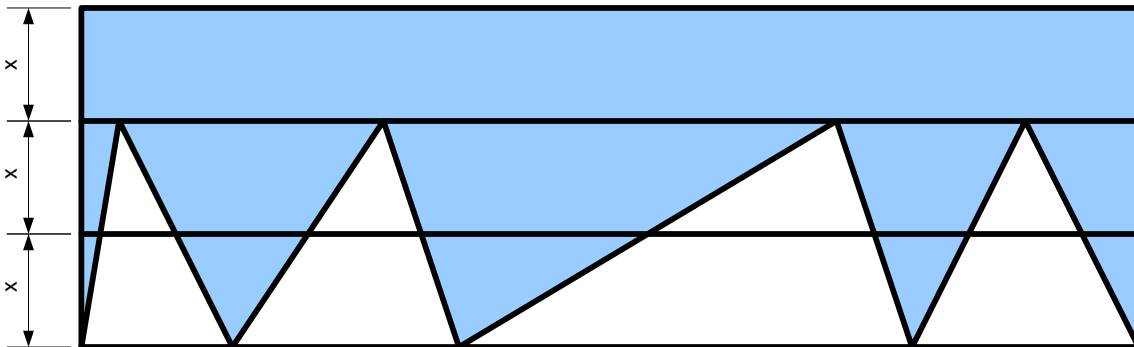


- 4 Find  $\frac{8}{15}$  of 75.

5 Circle the fractions below that have been split into quarters.



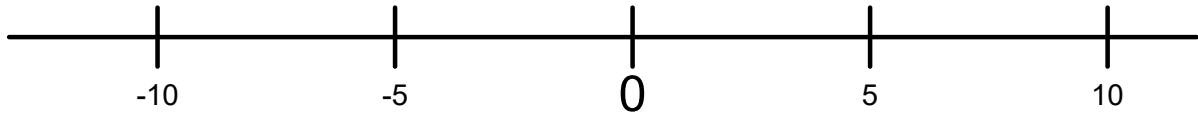
6 What fraction of the shape below is shaded?



7 Three pizzas are split equally amongst four people. What fraction of a whole pizza does one person receive?

## Directed Number

- 1 Put the following onto the number line.



Draw arrows and mark on the following numbers onto the number line above.

-12    8    -7.5    2.5    -1    9

- 2 Put the following numbers into ascending order.

$\frac{3}{4}$ ,    -2,     $-3\frac{1}{2}$ ,    3,    -3,     $-\frac{4}{5}$ ,    1

- 3 Answer the following questions

a.  $-3 + 7 =$

b.  $-7 - 12 =$

c.  $12 + 9 =$

d.  $8 - 15 =$

e.  $7 \times -2 =$

f.  $-5 \div -10 =$

g.  $-8 \times -\frac{1}{4} =$

h.  $-\frac{3}{5} \div -\frac{1}{4} =$

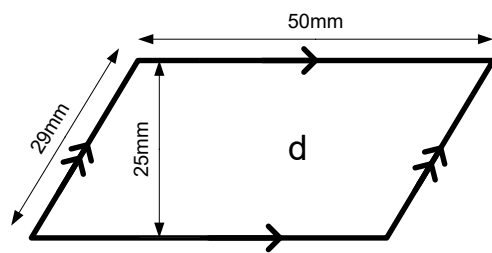
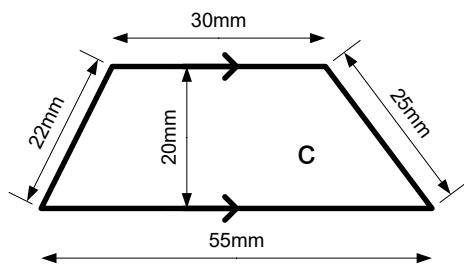
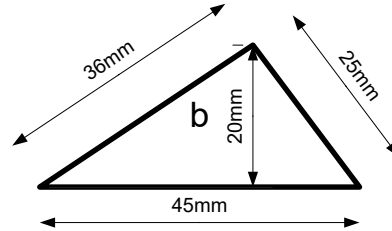
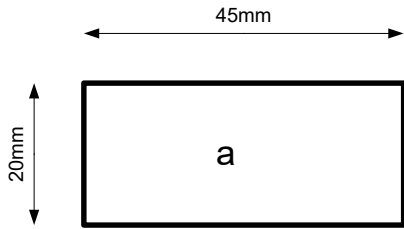
## Fractions and Percentages

- 1 What is 35% of 250?
  
- 2 What is 75% of 450?
  
- 3 What is 42% of 85?
  
- 4 What is 25% of -148?
  
- 5 What is 60% of -75?
  
- 6 Increase 250 by 30%.
  
- 7 Decrease 450 by 70%.
  
- 8 Increase 800 by 65%.
  
- 9 Decrease 240 by 40%.

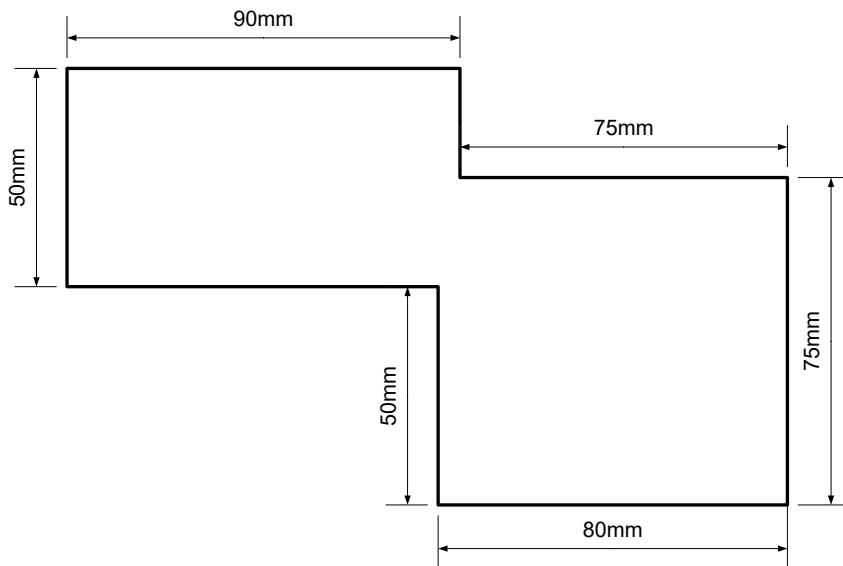
- 10 Billy put £3500 in a bank account for 12 years. The account paid 4.5% compound interest. How much was in his account at the end of the 12 years?
- 11 Cody bought a house for £375,000. the bank charged a compound interest rate of 5.25%. Cody had the mortgage for 25 years. How much money did he need to pay each month?
- 12 In a sale, a shop reduces its prices by 35%. Harrison buys a watch for £650. How much did the watch cost originally?
- 13 A car showroom increased its prices by 12%. The new price of a car was £24,000. What was the original price of the car?
- 14 Amelia went on holiday. They managed to negotiate a 15% reduction in the cost of the holiday. The holiday now cost £1560. What was the original price of the holiday?

## Perimeter and Area

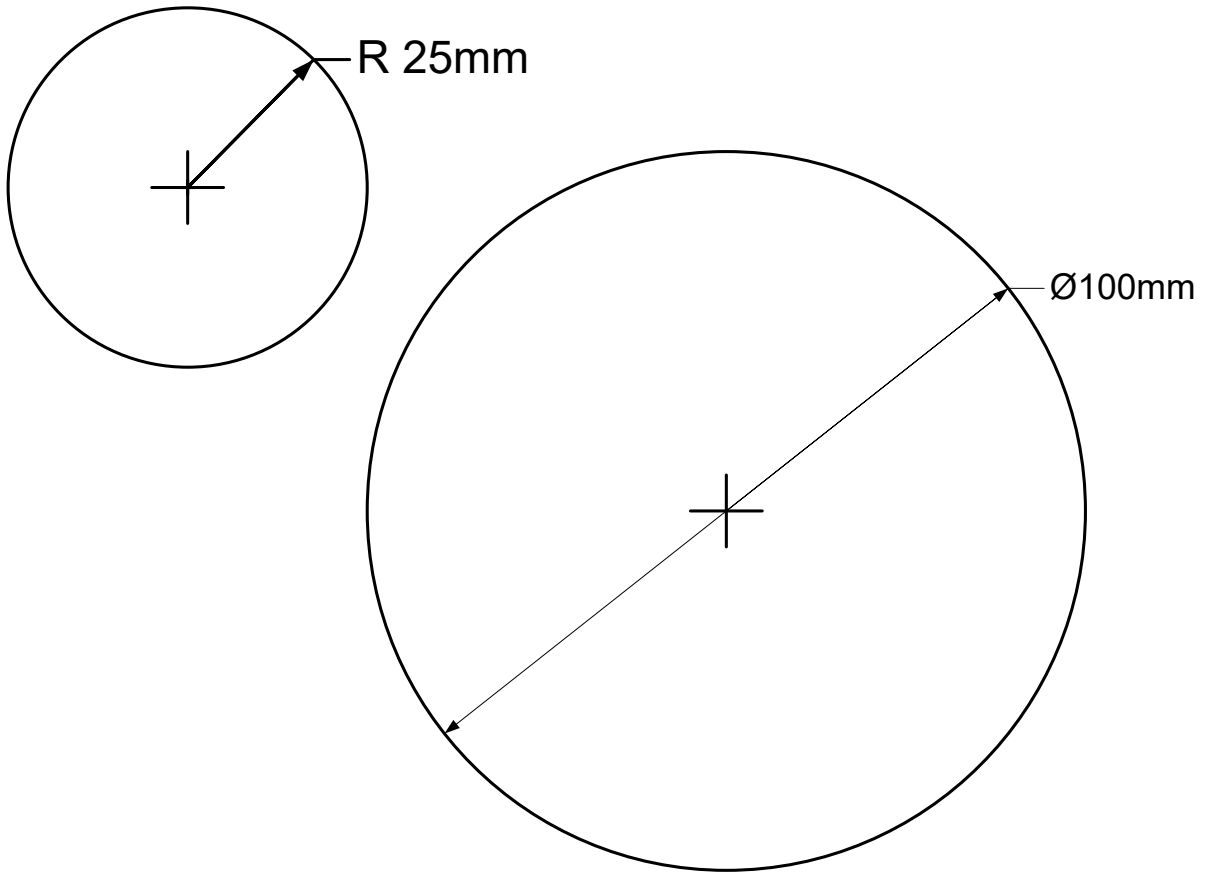
- 1 Find the perimeter and the area of the following shapes.



- 2 Mark on the distances of each side of the shape below and calculate its perimeter and area.



- 3 Find the area of the following circles. Give your answers correct to two decimal places.



### Challenging Questions

- 4 A circle has a circumference of 350 cm. What is its area?
- 5 A circle has an area of  $500\text{cm}^2$ . What is its circumference?