a

Put the following numbers in order from smallest to largest:

37%, $\frac{1}{3}$, 0.039, $\frac{11}{30}$

b

Evaluate:

13 + -3 × -7 + 12 ÷ -2 =

8 × (2 + 3) + (-5)² =

c

The price of a sewing machine is reduced by $\frac{1}{3}$ to £60.

What was its original price?

The price of a roll of fabric is reduced by 20% to £60.

What was its original price?

d

William thinks of a number, x, multiplies it by 2 then subtracts 4, the result is 22.

Write and solve an equation to show this information and to find the number that William first thought of.

e

x is directly proportional to y. When x = 3, y = 27. Find x when y = 9

x =

f
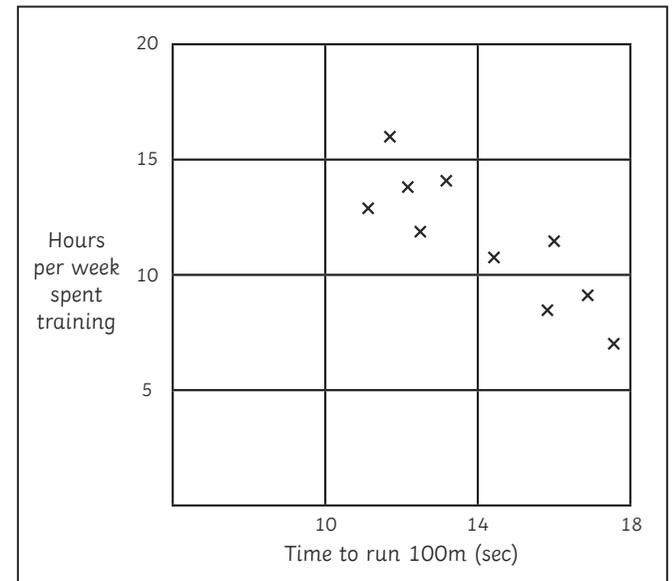
The scatter graph shows the time spent training and the time taken to run 100m for 10 members of The Whippets Running Club.

A new runner who does 2 hours of training a week joins the club. Would using a line of best fit to make an estimate of how long he or she takes to run 100m be reliable?

What about a runner who does 25 hours of training? Give reasons for your answers.

a

Solve:

$2x + 3 = 18$ $x =$

$5x - 9 = 6$ $x =$

b

Helen and Stephen buy 10 pizzas.

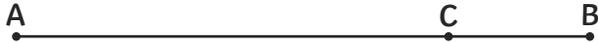Helen eats $2 \frac{3}{5}$ pizzas,

Stephen eats $1 \frac{3}{8}$ pizzas.

They then give half of what is left to Dexter.

How much pizza does Dexter get? Give your answer as a fully simplified mixed number.

c

A rectangle has width 9 cm and diagonal length 15 cm. What is its length?

d

Use a pair of compasses and ruler to construct the line which is perpendicular to the line AB and passes through C.

Do not erase your construction lines.

A   C   B
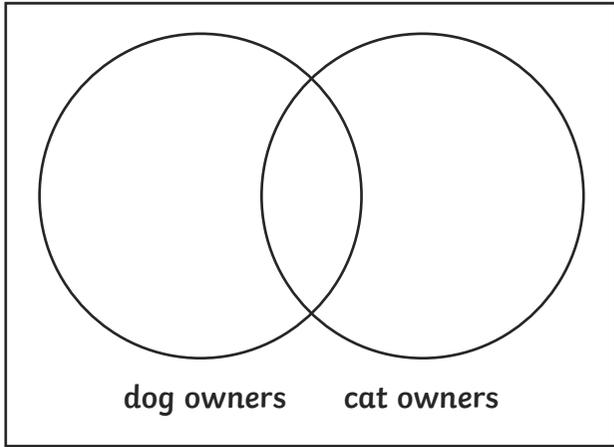
e

$0.3 \times 0.017 =$

$0.9 \div 0.012 =$

f

There are 30 children in 9C at Yulurn Hir School. 4 of them have both a dog and a cat. 11 of them have no cat or dog. 8 of them have cats.

A child is picked at random from those children who have dogs.

What is the probability that the picked child has a cat as well?

You may wish to use this Venn Diagram to help you.

dog owners   cat owners

a

Expand:

$2x(x^2 + 5) =$ [ ]

$3d(2ac + b) =$ [ ]

b

The table shows the scores earned in a ball game by a group of children.

Score	Frequency
0-2	1
3-5	11
6-8	10
9-11	3

Find an estimate for the mean score. [ ]

Find the modal class. [ ]

c

$\sqrt[3]{64} =$ [ ]

$(-2)^5 =$ [ ]

d

What is the multiplier for:

Increasing by 2%? [ ]

Finding 23%? [ ]

Decreasing by 13%? [ ]

e

Express 240 as the product of prime factors.

[ ]

Express 280 as the product of prime factors.

[ ]

Find the LCM and the HCF of 240 and 280.

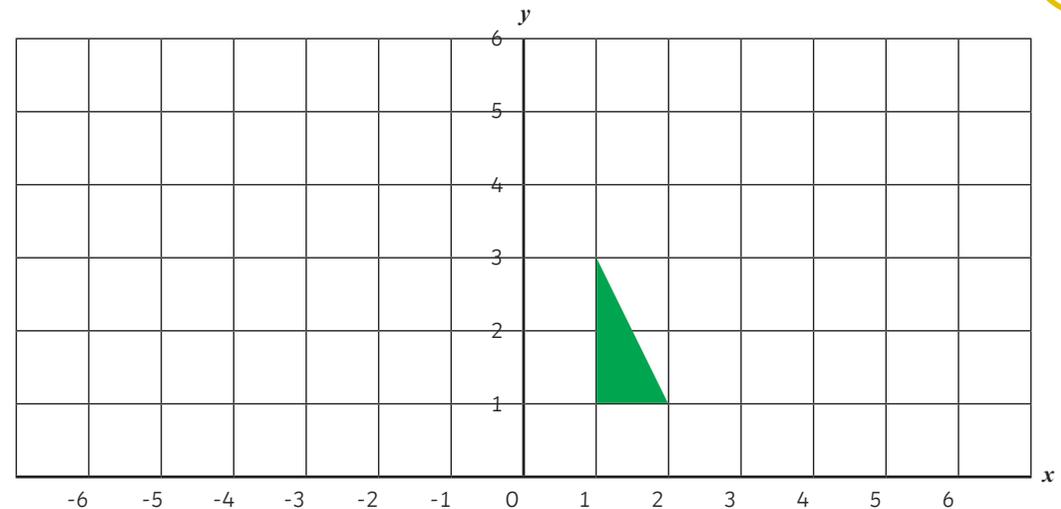LCM = [ ]   HCF = [ ]

f

Translate the shaded triangle by $\binom{-6}{2}$.

Enlarge the shaded triangle by a scale factor of 2, with the point (2,1) as the centre of enlargement.

Autumn Term **Maths Activities**

(4)

a Use rounding to estimate the value of:

$$\frac{4632+498}{12.5}$$

b

0.4m/s = ___ km/h

5cm³ = ___ l
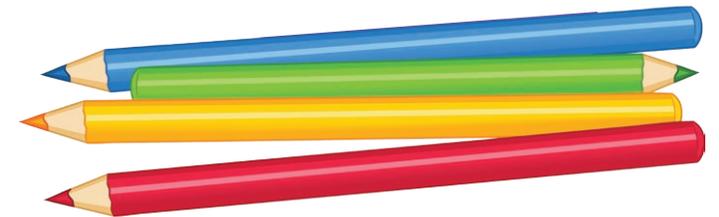
c Fully simplify:

$4ab - 2ba - 3a + b + a =$ ___

d There are some green, red, yellow and blue crayons in a box. The table shows the probability of taking green or red when a crayon is picked at random from the box. The probability of picking a yellow is the same as the probability of picking a blue. There are 20 crayons in the box.

Colour	Green	Red	Yellow	Blue
Probability	0.3	0.1		

How many of the crayons were blue? ___

e When x=5 and y=-3, evaluate:

$x + y^2$ ___

$\frac{2x - 3y}{2x}$ ___

f Write as an ordinary number:

$2.6 \times 10^4 =$ ___

Write in standard form:

0.00345 ___

a

You can buy 15 mini gingerbread men for 92p at Pixie's Bakery. At Elvis's Bakery 5 gingerbread men usually cost 40p.

At Elvis's, there is a 10% sale on prices advertised. Which bakery offers better value for money? Show all of your working.

b

What is the size of each interior angle in a regular nonagon?

c

Increase £40 by 32%.

d

What is the probability that, when 2 dice are thrown, the total score on them will be a 2?

e

The triangular cross section of a triangular prism has height 4cm and base 10cm. The length between the triangular faces is 5cm.

What is the volume of the triangular prism?

f

Simplify the ratio:

6 cm: 10 mm: 0.12 m

Annie and Billy share some money in the ratio 2:3. Annie gets £5.40.

How much money does Billy get?

a

Factorise:

$6xy + 15xz$

b

16, 24, 36, 54 ...

What is the term to term rule in this sequence?

c

5, 9, 13, 17 ...

What is the nth term of the sequence?

What is the 20th term in the sequence?

d

Find the area and the circumference of a circle of diameter 6cm. Give your answer in terms of π

Area:

Circumference:

e

Express as a single power of 2:

$(2^3)^5$

$8 × 2^5$

f

Complete the tables of values for the graphs:

$y = x^2 + 3x + 2$

x	-3	-2	-1	0	1	2	3
y							

$y = -x + 3$

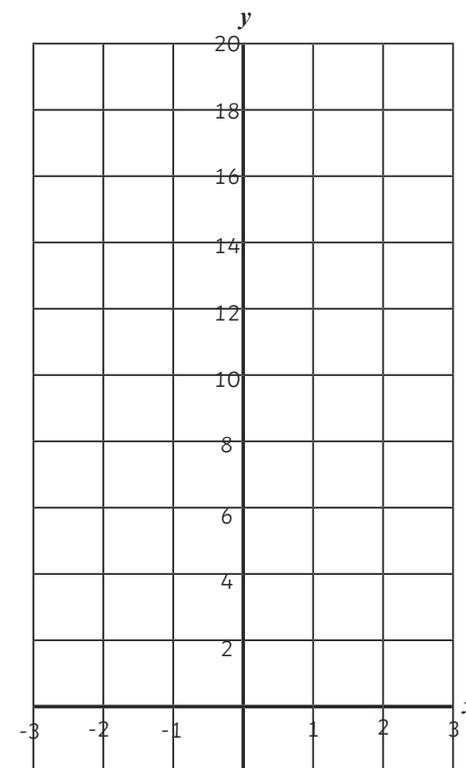| x	-3	-2	-1	0	1	2	3
y							

On the axes below, draw the graph of

a) $y = x^2 + 3x + 2$ b) $y = -x + 3$

Give the point of intersection of the graphs.

a

Put the following numbers in order from smallest to largest:

37%, $\frac{1}{3}$, 0.039, $\frac{11}{30}$

0.039, $\frac{1}{3}$, $\frac{11}{30}$, 37%

b

Evaluate:

13 + -3 × -7 + 12 ÷ -2 = **28**

8 × (2 + 3) + (-5)² = **65**

c

The price of a sewing machine is reduced by $\frac{1}{3}$ to £60.

What was its original price?

£90

The price of a roll of fabric is reduced by 20% to £60.

What was its original price?

£75

d

William thinks of a number, x, multiplies it by 2 then subtracts 4, the result is 22.

Write and solve an equation to show this information and to find the number that William first thought of.

2x – 4 = 22

x = 13

e

x is directly proportional to y. When x = 3, y = 27. Find x when y = 9   **x = 1**

f

The scatter graph shows the time spent training and the time taken to run 100m for 10 members of The Whippets Running Club.

A new runner who does 2 hours of training a week joins the club. Would using a line of best fit to make an estimate of how long he or she takes to run 100m be reliable?

No, there is no data for runners who train for any time close to 2 hours on which to base an assumption.

What about a runner who does 25 hours of training? Give reasons for your answers.

No, there are no runners in this sample who do this much training and the prediction would make her a record breaker.

a

Solve:

$2x + 3 = 18$ | $x = 7.5$

$5x - 9 = 6$ | $x = 3$

c

A rectangle has width 9cm and diagonal length 15cm. What is its length?

12cm

e

$0.3 × 0.017 =$ | **0.0051**

$0.9 ÷ 0.012 =$ | **75**

b

Helen and Stephen buy 10 pizzas.
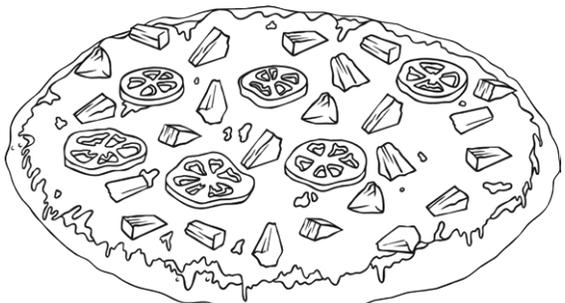
Helen eats $2\frac{3}{5}$ pizzas,

Stephen eats $1\frac{3}{8}$ pizzas.
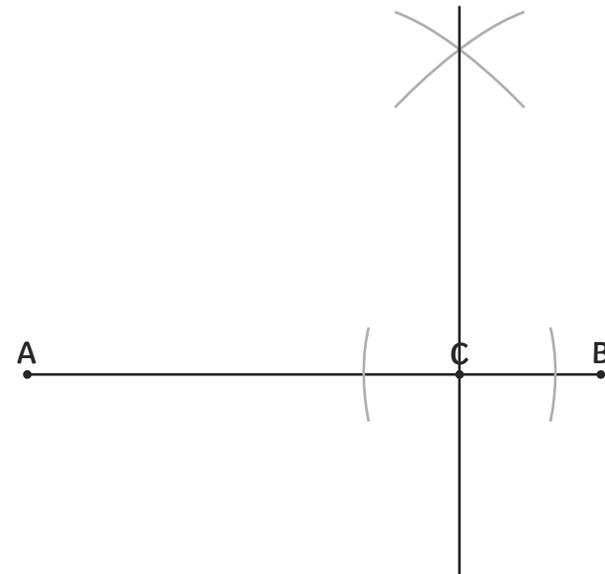
They then give half of what is left to Dexter.

How much pizza does Dexter get? Give your answer as a fully simplified mixed number.

$3\frac{1}{80}$

d

Use a pair of compasses and ruler to construct the line which is perpendicular to the line AB and passes through C. Do not erase your construction lines.

A   C   B
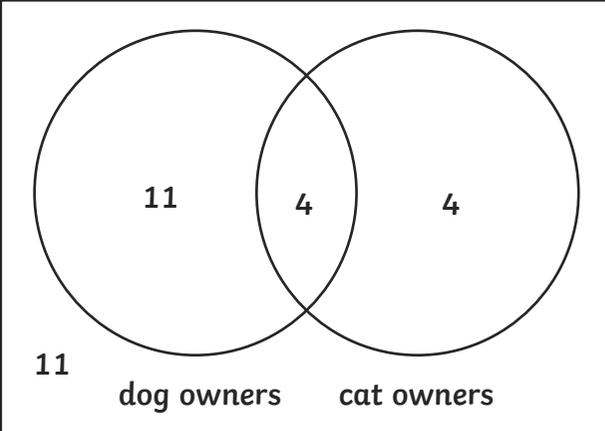
f

There are 30 children in 9C at Yulurn Hir School. 4 of them have both a dog and a cat. 11 of them have no cat or dog. 8 of them have cats.

A child is picked at random from those children who have dogs.

What is the probability that the picked child has a cat as well? $\frac{4}{15}$

You may wish to use this Venn Diagram to help you.

11   4   4

11

dog owners   **cat owners**

a

Expand:

$2x(x^2 + 5) =$ | $2x^3 + 10x$

$3d(2ac + b) =$ | $6acd + 3bd$

b

The table shows the scores earned in a ball game by a group of children.

Score	Frequency
0-2	1
3-5	11
6-8	10
9-11	3

Find an estimate for the mean score. | 5.8

Find the modal class. | 3-5

c

$\sqrt[3]{64} =$ | 4

$(-2)^5 =$ | −32

d

What is the multiplier for:

Increasing by 2%? | 1.02

Finding 23%? | 0.23

Decreasing by 13%? | 0.87

f

Translate the shaded triangle by $\binom{-6}{2}$.

Enlarge the shaded triangle by a scale factor of 2, with the point (2,1) as the centre of enlargement.

Triangle with vertices at (-5,5) (-5,3) (-4,3)

Triangle with vertices at (2,1) (0,1) (0,5)

e

Express 240 as the product of prime factors.

$2^4 × 3 × 5$

Express 280 as the product of prime factors.

$2^3 × 5 × 7$

Find the LCM and the HCF of 240 and 280.

LCM = 1680 | HCF = 40

a

Use rounding to estimate the value of:

$\dfrac{4632+498}{12.5}$ | **550** |

b

0.4m/s = | **1.44km/h** |

5cm^3 = | **0.005l** |

c

Fully simplify:

$4ab - 2ba - 3a + b + a =$ | **2ab - 2a + b** |

d

There are some green, red, yellow and blue crayons in a box. The table shows the probability of taking green or red when a crayon is picked at random from the box. The probability of picking a yellow is the same as the probability of picking a blue. There are 20 crayons in the box.

Colour	Green	Red	Yellow	Blue
Probability	0.3	0.1	**0.3**	**0.3**

How many of the crayons were blue? | **6** |

e
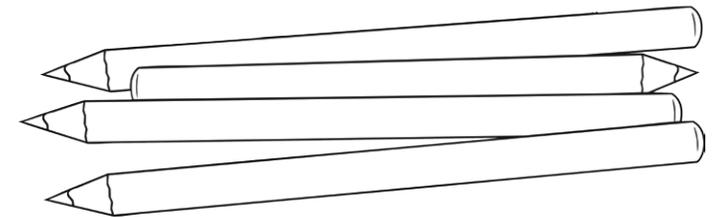
When x = 5 and y = −3, evaluate:

$x + y^2$ | **14** |

$\dfrac{2x - 3y}{2x}$ | **1.9** |

f

Write as an ordinary number:

$2.6 \times 10^4 =$ | **26000** |

Write in standard form:

| **3.45 × 10^{-3}** |

a

You can buy 15 mini gingerbread men for 92p at Pixie's Bakery. At Elvis's Bakery 5 gingerbread men usually cost 40p.

At Elvis's, there is a 10% sale on prices advertised. Which bakery offers better value for money? Show all of your working.

Pixie's Bakery

6.13p per gingerbread man at Pixie's

36÷5 = 7.2p per gingerbread man at Elvis's

b

What is the size of each interior angle in a regular nonagon?

140°

c

Increase £40 by 32%.   **£52.80**

d

What is the probability that, when 2 dice are thrown, the total score on them will be a 2?

$\dfrac{1}{36}$

e

The triangular cross section of a triangular prism has height 4cm and base 10cm. The length between the triangular faces is 5cm.

What is the volume of the triangular prism?

100cm³

f

Simplify the ratio:

6 cm: 10 mm: 0.12 m

6:1:12

Annie and Billy share some money in the ratio 2:3. Annie gets £5.40.

How much money does Billy get?

£8.10

a

Factorise:

$6xy + 15xz$ **$3x(2y + 5z)$**

b

16, 24, 36, 54 …

What is the term to term rule in this sequence?

× 1.5   **or equivalent, eg. × 3 ÷ 2**

c

5, 9, 13, 17 …

What is the nth term of the sequence?

$4n + 1$

What is the 20th term in the sequence?

81

d

Find the area and the circumference of a circle of diameter 6cm. Give your answer in terms of π

Area: **$9π$ cm²**

Circumference: **$6π$ cm**

e

Express as a single power of 2:

$(2^3)^5$ **2^{15}**

$8 × 2^5$ **2^8**

f

Complete the tables of values for the graphs:

$y = x^2 + 3x + 2$

x	-3	-2	-1	0	1	2	3
y	**2**	**0**	**0**	**2**	**6**	**12**	**20**

$y = -x + 3$

x	-3	-2	-1	0	1	2	3
y	**6**	**5**	**4**	**3**	**2**	**1**	**0**

On the axes below, draw the graph of

a) $y = x^2 + 3x + 2$ b) $y = -x + 3$

Give the point of intersection of the graphs.   **(0.2, 2.8)**