Autumn Term **Maths Activities**

a

Put the following numbers in order from smallest to largest:

$2.6 × 10^2$, 2.6^3, $0.027 × 10^3$, $250 × 10^{-3}$

b

Evaluate:

$13 + \text{-}0.3 × \text{-}7.5 + 12.6 ÷ \text{-}2 =$

$8 × (\frac{1}{4} + 3) + (\frac{\text{-}1}{2})^2 =$

c

The price of a games console is reduced by $\frac{1}{3}$ to £96.

What was its original price?

The price of a flash drive is reduced by 24% to £6.08.

What was its original price?

d

William thinks of a number, x, multiplies it by 2 then adds 4.

Robert multiplies x by 7 then subtracts 17. They obtain the same answer

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

$x =$

e

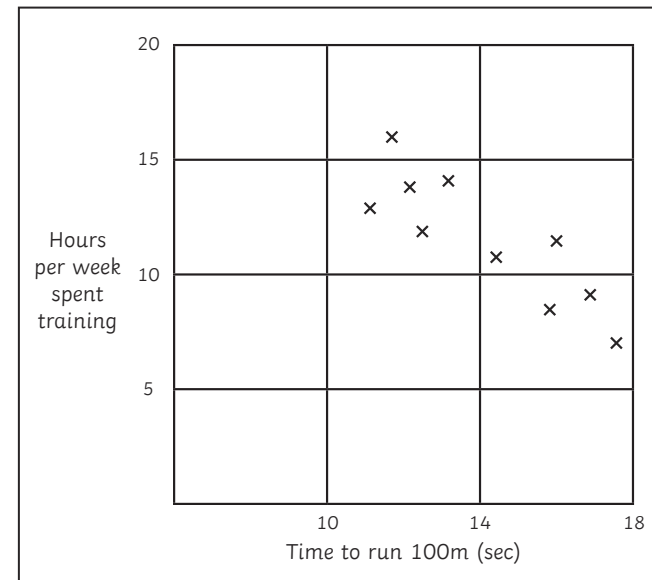x is inversely proportional to y. When x = 3, y = 27. Find x when y = 9.

$x =$

f

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

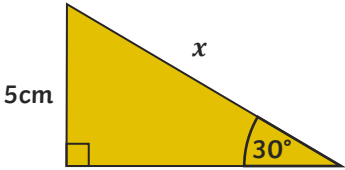**Draw a line of best fit.**

Estimate its equation.

Hours per week spent training

Time to run 100m (sec)

a

Solve:

$3x + 5 = 5x - 3 =$ $x =$

$2(x + 3) = 4x$ $x =$

b

Helen and Stephen buy 10.3 pizzas.

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

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

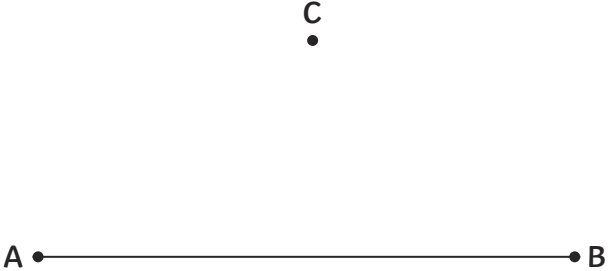They then give half of what is left to Dexter.

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

c

Given that sin 30° = 0.5, find x by calculation.

x

5cm

30°

d

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

Do not erase your construction lines.

C

A •————————————• B

e

Give your answers correct to 4 decimal places:

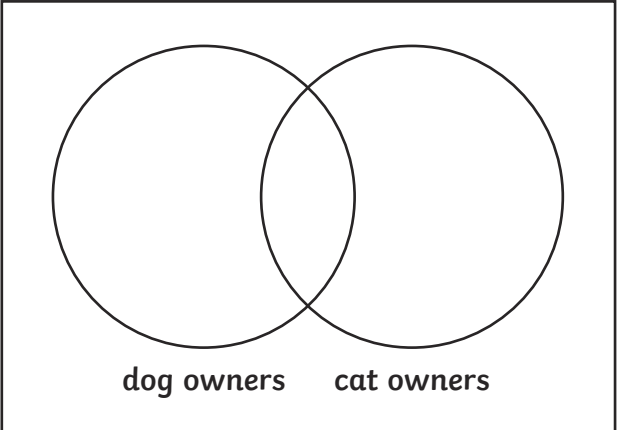$0.008 \times (0.8 + 0.32) =$

$0.83 \div 0.7 =$

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.

Find the number of dog owners.

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

dog owners   cat owners

a

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.

In which group does the median lie?

What is the highest the range could be?

What is the lowest the range could be?

b

$\sqrt[5]{-32}$ =

$\sqrt{25}$ =

c

What is the multiplier for:

Decreasing by 0.5%

Increasing by 186%

Finding 100.2%

d

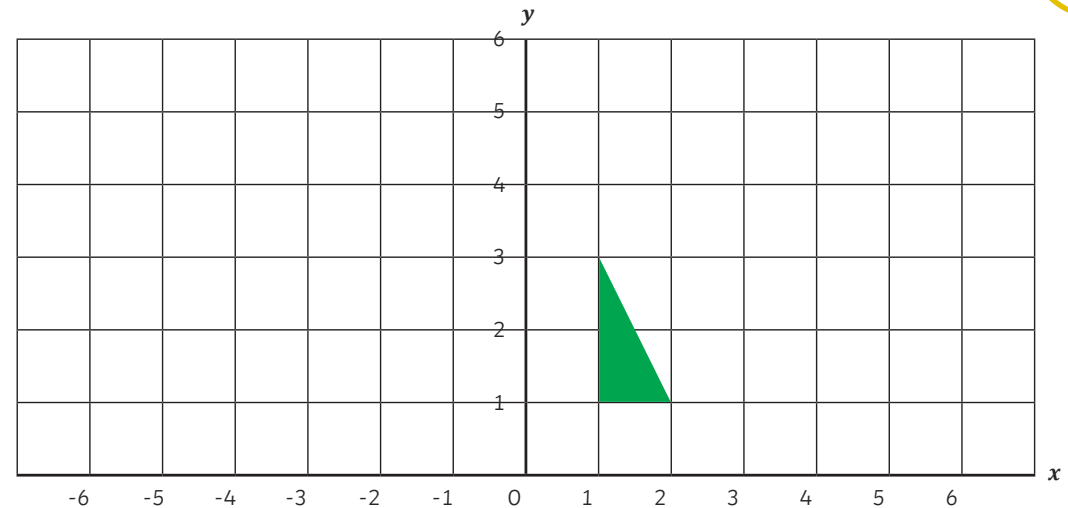Find the smallest number which has 1, 2, 3, 4, 5, 6 and 7 as factors.

e

Expand:

$(x + 3)(x + 5)$

$(2y + 3)(y - 2)$

f

Translate the shaded triangle by $\begin{pmatrix} -6 \\ 2 \end{pmatrix}$.

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

a

Use rounding to estimate the value of:

$$\frac{0.345 + 3.54}{0.48}$$

b

0.12m/s =   km/h

0.3g/cm³ =   kg/m³
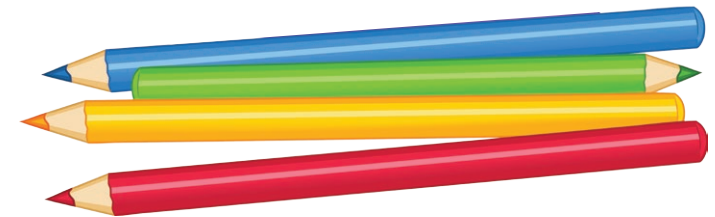
c

Fully simplify:

$-6xy + yx + x^2y - 3yx^2 =$

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 16 green crayons in the box.

Colour	Green	Red	Yellow	Blue
Probability	0.2	0.1		

How many of the crayons were blue?

e

When x = 5 and y = −3, evaluate:

$2(y - x)^2$

$\dfrac{x}{y} - \dfrac{y}{x}$

f

Evaluate:

$1.7 \times 10^5 \times 3.8 \times 10^{-9}$

Give your answer in standard form.

a

My dog's mass increases from 20kg to 24kg over a period of 1 month.

By what percentage has his weight increased?

b

The density of oak is 0.7g/cm³. An oak table is made from 0.1m³ of oak.

What is the mass of the table?

c

Candace has a ratio of 7:17 goals scored to goal attempts made in netball this term. Bailey's ratio is 9:21.

Who has been more successful when attempting to score goals?

Show your working.

d

The trapezium cross section of a prism has parallel sides 4cm and 7cm and the perpendicular distance between the two parallel sides is 5cm. The length between the two trapezium faces is 60cm.

What is the volume of the prism?

e

The interior angle of a regular polygon is twice as big as the exterior angle.

How many sides does the polygon have?

f

What is the probability that, when 2 dice are thrown, the total score on them will be a 7?

a

Factorise:

$3x^2y + 9xy^2$ ⬚

b

2, 5, 7, 12, 19, …

What are the next two terms in this sequence?

⬚

c

8, 15, 22, 29, …

What is the nth term of the sequence?

⬚

Is 2345 a term in ⬚
the sequence?

Give a reason for your answer.

d

A circular lawn of radius 10m has a circular flower bed of radius 5m dug into it.

What is the area of the remaining lawn? Give your answer in terms of π.

⬚

e

Express as a single power of 2:

$64 × 16$ ⬚

$(32^2)^3$ ⬚

f

Complete the tables of values for the graph:

$y = x^2 + 2$

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

On the axes, draw the graph of:

$y = x^2 + 2$

Give the:

coordinates of the minimum point: ⬚

equation of line of symmetry: ⬚

a

Put the following numbers in order from smallest to largest:

2.6×10^2, 2.6^3, 0.027×10^3, 250×10^{3}

| 250×10^{-3}, 2.6^3, 0.027×10^3, 2.6×10^2 |

b

Evaluate:

$13 + \text{-}0.3 \times \text{-}7.5 + 12.6 \div \text{-}2 =$ | **8.95** |

$8 \times \left(\frac{1}{4} + 3 \right) + \left(\frac{\text{-}1}{2} \right)^2 =$ | **26.25** |

c

The price of a games console is reduced by $\frac{1}{3}$ to £96.

What was its original price?

| **£144** |

The price of a flash drive is reduced by 24% to £6.08.

What was its original price?

| **£8** |

d

William thinks of a number, x, multiplies it by 2 then adds 4.

Robert multiplies x by 7 then subtracts 17. They obtain the same answer

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

$2x + 4 = 7x - 17$

$x = 4.2$

e

x is inversely proportional to y. When x = 3, y = 27. Find x when y = 9. | **$x = 9$** |

f

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

Draw a line of best fit.

Estimate its equation. | **$y = -x + 22$** |

a

Solve:

$3x + 5 = 5x - 3 =$ | $x = 4$

$2(x + 3) = 4x$ | $x = 3$

c

Given that sin 30° = 0.5, find x by calculation.

10cm

5cm

x

30°

e

Give your answers correct to 4 decimal places:

0.008 × (0.8 + 0.32) = | 0.0090

0.83 ÷ 0.7 = | 1.1857

b

Helen and Stephen buy 10.3 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.

$3\frac{13}{80}$

d

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

Do not erase your construction lines.

C

A •————————————• 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.

Find the number of dog owners. | 15

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

11   4   4

11

dog owners   cat owners

a

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

In which group does the median lie?

6-8

What is the highest the range could be?

11

What is the lowest the range could be?

7

b

$\sqrt[5]{-32}$ = **−2**

$\sqrt{25}$ = **5 and −5**

c

What is the multiplier for:

Decreasing by 0.5%   **0.995**

Increasing by 186%   **2.86**

Finding 100.2%   **1.002**

d

Find the smallest number which has 1, 2, 3, 4, 5, 6 and 7 as factors.

420

e

Expand:

$(x + 3)(x + 5)$ **$x^2 + 8x + 15$**

$(2y + 3)(y - 2)$ **$2y^2 - y - 6$**

f

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

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

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

Triangle with vertices at (-3,1) (-3,3) (-4,3)

a

Use rounding to estimate the value of:

$$\frac{0.345 + 3.54}{0.48}$$ **8.6**

b

0.12m/s = **0.432km/h**

0.3g/cm³ = **300kg/m³**

c

Fully simplify:
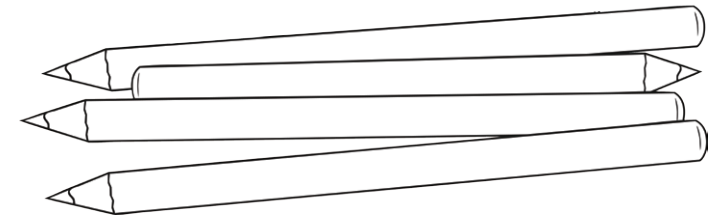
$-6xy + yx + x^2y - 3yx^2 =$

$-5xy - 2x^2y$

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 16 green crayons in the box.

Colour	Green	Red	Yellow	Blue
Probability	0.2	0.1	**0.35**	**0.35**

How many of the crayons were blue? **28**

e

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

$2(y - x)^2$ **128**

$\dfrac{x}{y} - \dfrac{y}{x}$ **$-\dfrac{11}{15}$**

f

Evaluate:

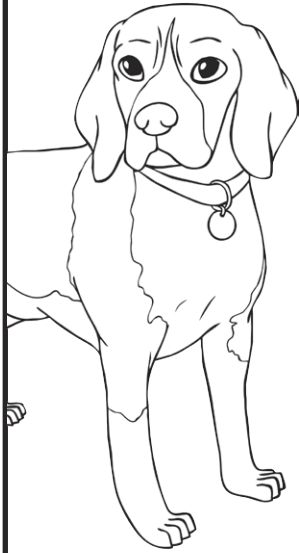$1.7 \times 10^5 \times 3.8 \times 10^{-9}$

Give your answer in standard form.

6.46×10^{-4}

a

My dog's mass increases from 20kg to 24kg over a period of 1 month.

By what percentage has his weight increased.

20%

b

The density of oak is 0.7g/cm³. An oak table is made from 0.1m³ of oak.

What is the mass of the table?

70kg

c

Candace has a ratio of 7:17 goals scored to goal attempts made in netball this term. Bailey's ratio is 9:21.

Who has been more successful when attempting to score goals?

Show your working.

Bailey

Candace 63:153

Bailey 63:147

Bailey has been more successful as he got more goals per attempt.

d

The trapezium cross section of a prism has parallel sides 4cm and 7cm and the perpendicular distance between the two parallel sides is 5cm. The length between the two trapezium faces is 60cm.

What is the volume of the prism?

1650cm³

e

The interior angle of a regular polygon is twice as big as the exterior angle.

How many sides does the polygon have?

6

f

What is the probability that, when 2 dice are thrown, the total score on them will be a 7?

$\frac{1}{6}$

a

Factorise:

$3x^2y + 9xy^2$ | $3xy(x+3y)$

b

2, 5, 7, 12, 19, ...

What are the next two terms in this sequence?

| **31, 50** |

c

8, 15, 22, 29, ...

What is the nth term of the sequence?

| **7n + 1** |

Is 2345 a term in the sequence? | **No** |

Give a reason for your answer.

7n+1 = 2345

7n = 2344

2344 ÷ 7 is not a whole number. 2345 is not a term in the sequence.

d

A circular lawn of radius 10m has a circular flower bed of radius 5m dug into it.

What is the area of the remaining lawn? Give your answer in terms of π.

| **75π** |

e

Express as a single power of 2:

64 × 16 | **2^{10}**

$(32^2)^3$ | **2^{30}**

f

Complete the tables of values for the graph:

$y = x^2 + 2$

x	-3	-2	-1	0	1	2	3
y	**11**	**6**	**3**	**2**	**3**	**6**	**11**

On the axes, draw the graph of:

$y = x^2 + 2$

Give the:

coordinates of the minimum point: | **(0,2)** |

equation of line of symmetry: | **$x = 0$** |