Name:

Developing Algebra 3

Additional Tasks

Contents

Quiz 1

1) 2.4 + 5.89	2) $\frac{2}{3} + \frac{1}{2}$	3) 20% of £60
4) The median of 6, 2, 4, 9, 1, 8	5) Solve $x - 4 = 6$	6) What is the area of the rectangle? 6 cm 3 cm
7) What is the formula for calculating the circumference of a circle?	8) Sketch a frequency diagram.	9) Simplify $3x + 9y + 4x - 2y$

___ out of 9

Example 1

What is the nth term of the following sequence?

14, 18, 22, 26, 30, ...

10 14, 18, 22, 26, 30, ...

-4 +4 +4 +4 +4

Nth term: $4n + 10$

Exercise 1

What is the nth term of the following sequence?

14, 17, 20, 23, 26, ...

___ out of 2

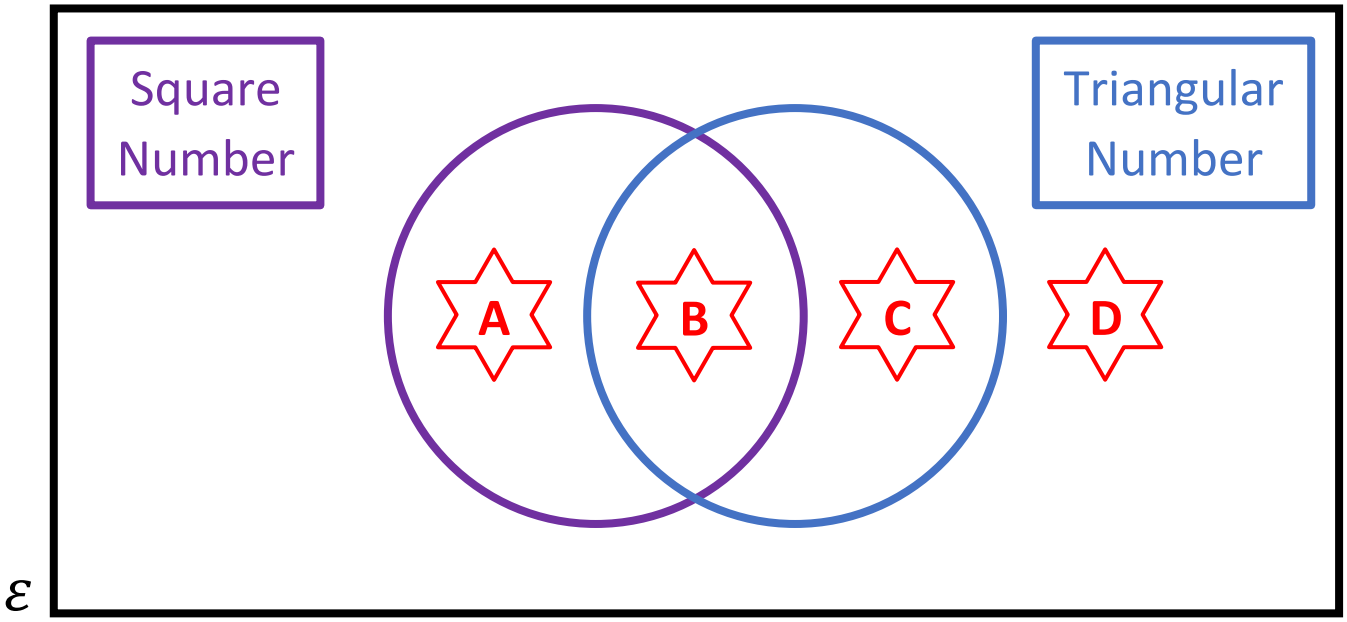
Quiz 2

Solve the following equations.

1) $x + 3 = 10$	2) $3x = 24$	3) $\frac{x}{2} = 6$
4) $y - 4 = 15$	5) $2z = 1$	6) $\frac{12}{x} = 4$
7) $2x + 1 = 13$	8) $3y - 2 = 19$	9) $\frac{x}{3} + 2 = 11$

____ out of 9

Venn Diagram Challenge 1



Think of a number that could go into each region.
If you think a region is impossible to fill, explain why!

A

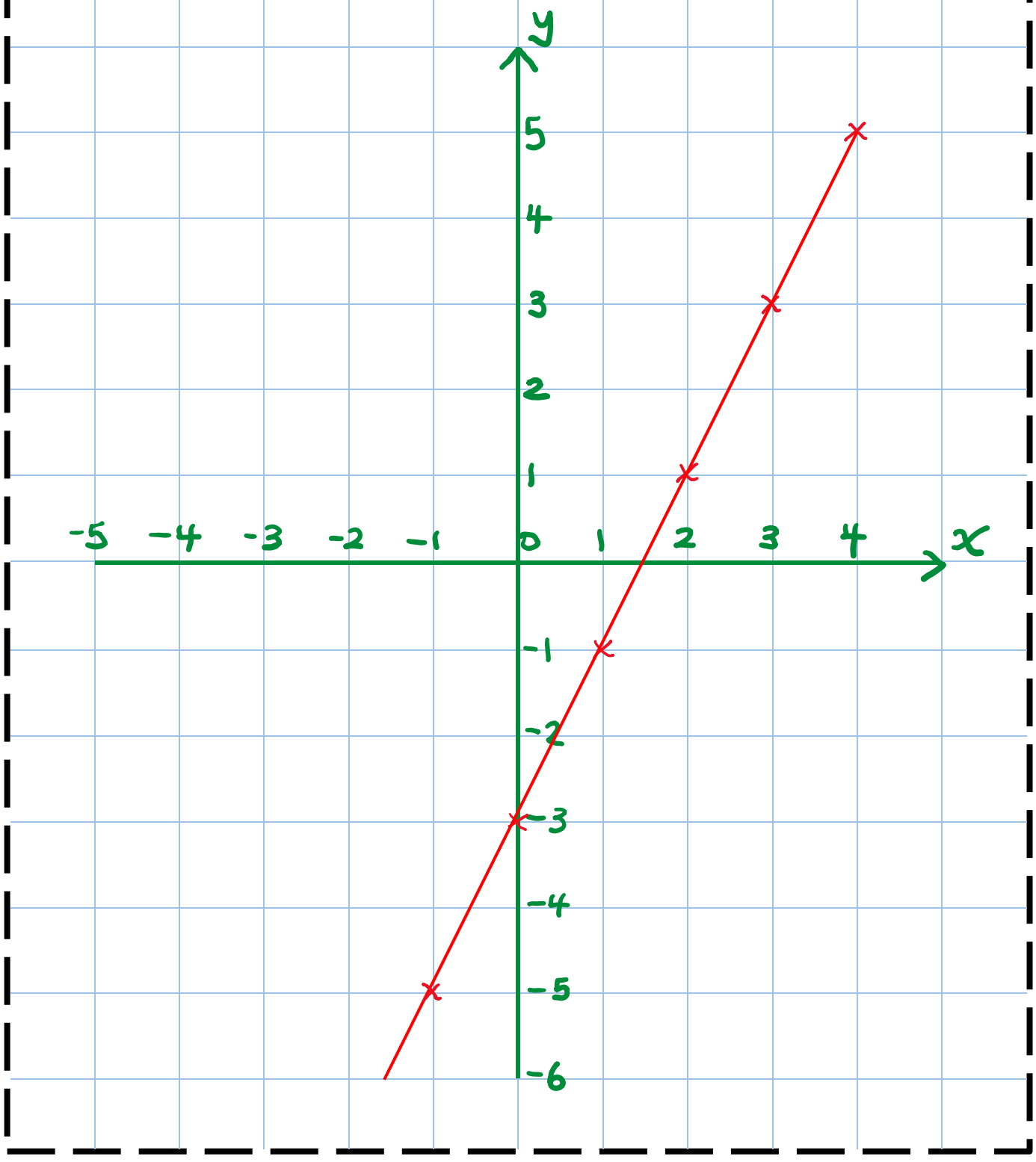
B

C

D

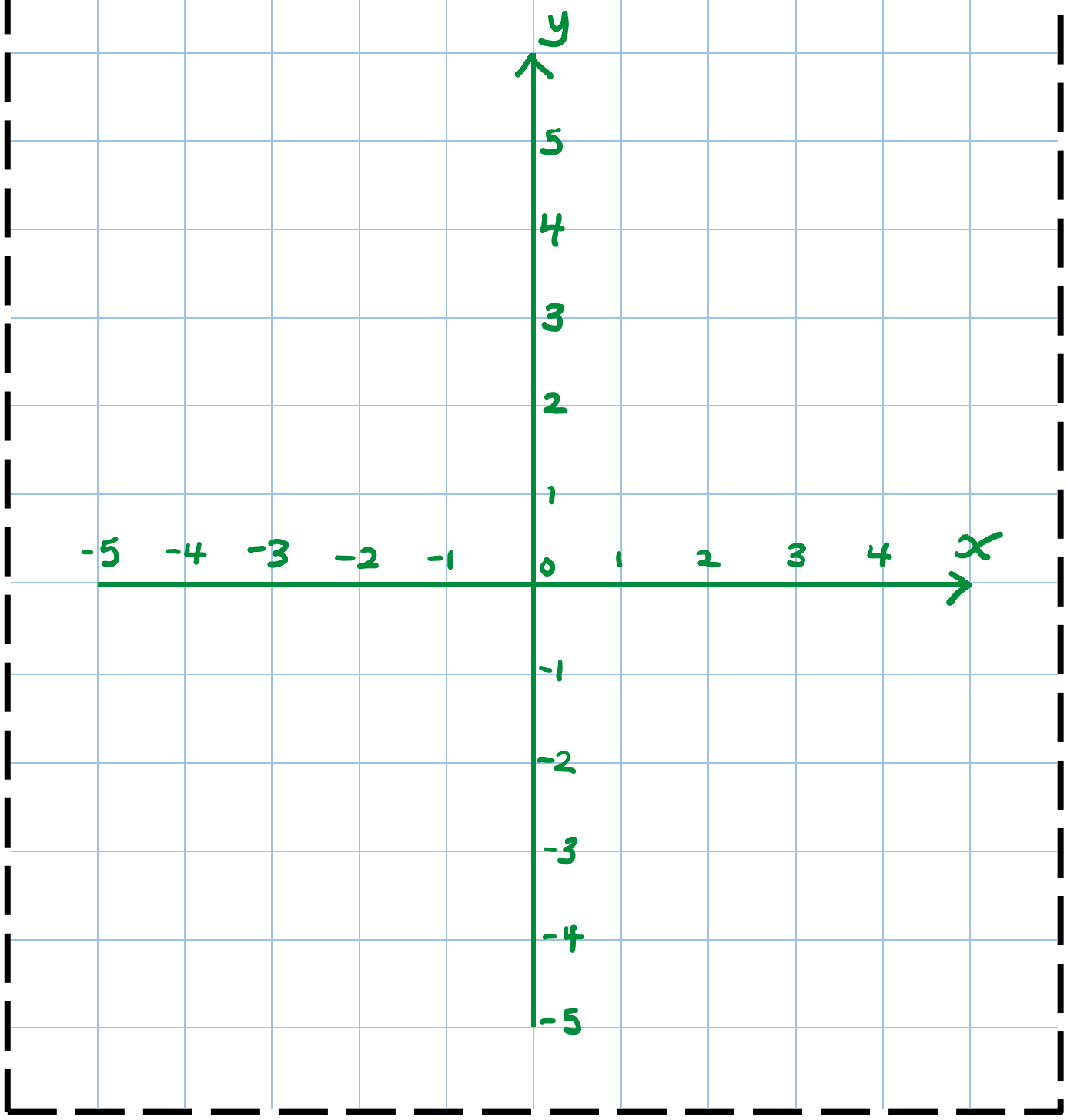
Example 2

Plot a graph for the equation $y = 2x - 3$.



Exercise 2

Plot a graph for the equation $y = -3x + 4$.



___ out of 2

Quiz 3

Consider the numbers in the following list.

21, 22, 23, 24, 25, 26, 27, 28, 29, 30.

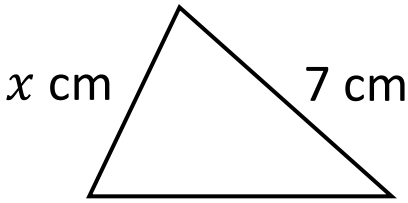
Using only numbers from the above list, write

1) The multiples of 4	2) A square number	3) A factor of 60
4) A cube number	5) All the prime numbers	6) A multiple of both 2 and 3
7) The even numbers	8) Two numbers with a difference of 8	9) Half of 58

___ out of 9

The Triangle and the Rectangle

A triangle and a rectangle are shown below.



The diagrams are not drawn to scale

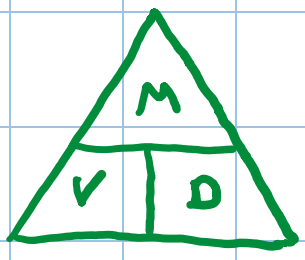
The perimeter of the triangle is 18 cm.

What can you work out using this information?

Example 3

The density of a piece of metal is 2.8 g/cm³.

If the piece of metal has volume 40 cm³, what is its mass?



Mass = Volume × Density

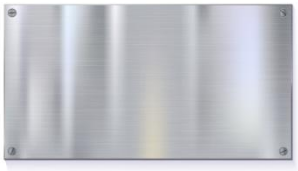
= 40 × 2.8

= 112 g

Exercise 3

The density of a piece of metal is 2.5 g/cm³.

If the piece of metal has volume 58 cm³, what is its mass?



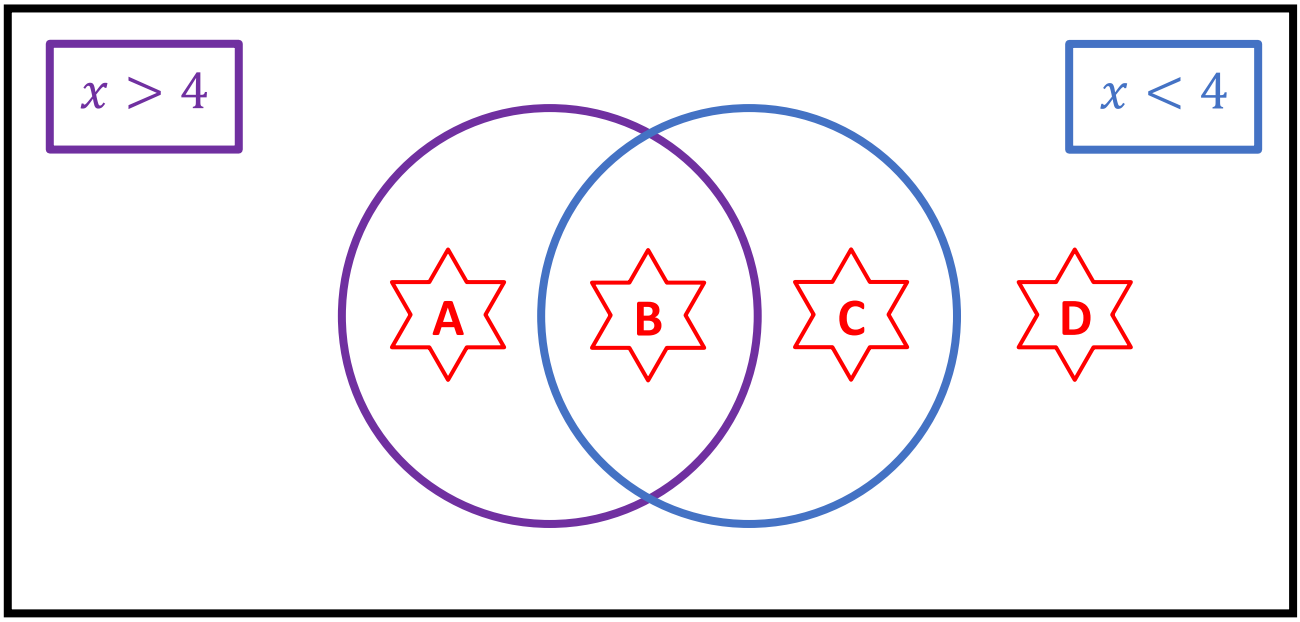
___ out of 3

Quiz 4

1) Expand $4(x+2)$	2) Expand $(x+3)(x+5)$	3) Solve $7x-3=25$
4) Make g the subject of the formula $f=2-3g$	5) Simplify $8a-2a+3a$	6) Substitute $x=3$ into $3x-4$
7) Solve $\frac{y}{4}=8$	8) Factorise $12x-16$	9) Factorise x^2-5x

___ out of 9

Venn Diagram Challenge 2



Think of a number for x that could go into each region.
If you think a region is impossible to fill, explain why!

A

B

C

D

Example 4

The measurements of the following rectangle are given correct to the nearest centimetre. Calculate the largest possible perimeter of the rectangle.

Greatest Possible Length: 7.5cm

Greatest Possible Width: 4.5cm

Greatest Possible Perimeter:

$7.5 + 4.5 + 7.5 + 4.5 = 24\text{cm}$

Exercise 4

The measurements of the following rectangle are given correct to the nearest centimetre. Calculate the least possible area of the rectangle.

___ out of 4

Quiz 5

Solve the following inequalities.

1) $x + 4 > 8$	2) $3x \leq 27$	3) $y - 3 < 10$
4) $\frac{z}{2} \geq 6$	5) $-2x > 10$	6) $\frac{x}{-3} \leq -2$
7) $4x - 2 < 18$	8) $2 - 4x \geq 18$	9) $\frac{x+3}{5} < 5$

___ out of 9

Pancakes

1) How much plain flour is needed to make 36 pancakes?

2) How much milk is needed to make 6 pancakes?

3) What is the greatest number of pancakes you can make with 3 eggs?

4) Ceri has half a pint of milk left in the fridge. Is this enough to make 12 pancakes?

___ out of 8

Evaluating the Workbook

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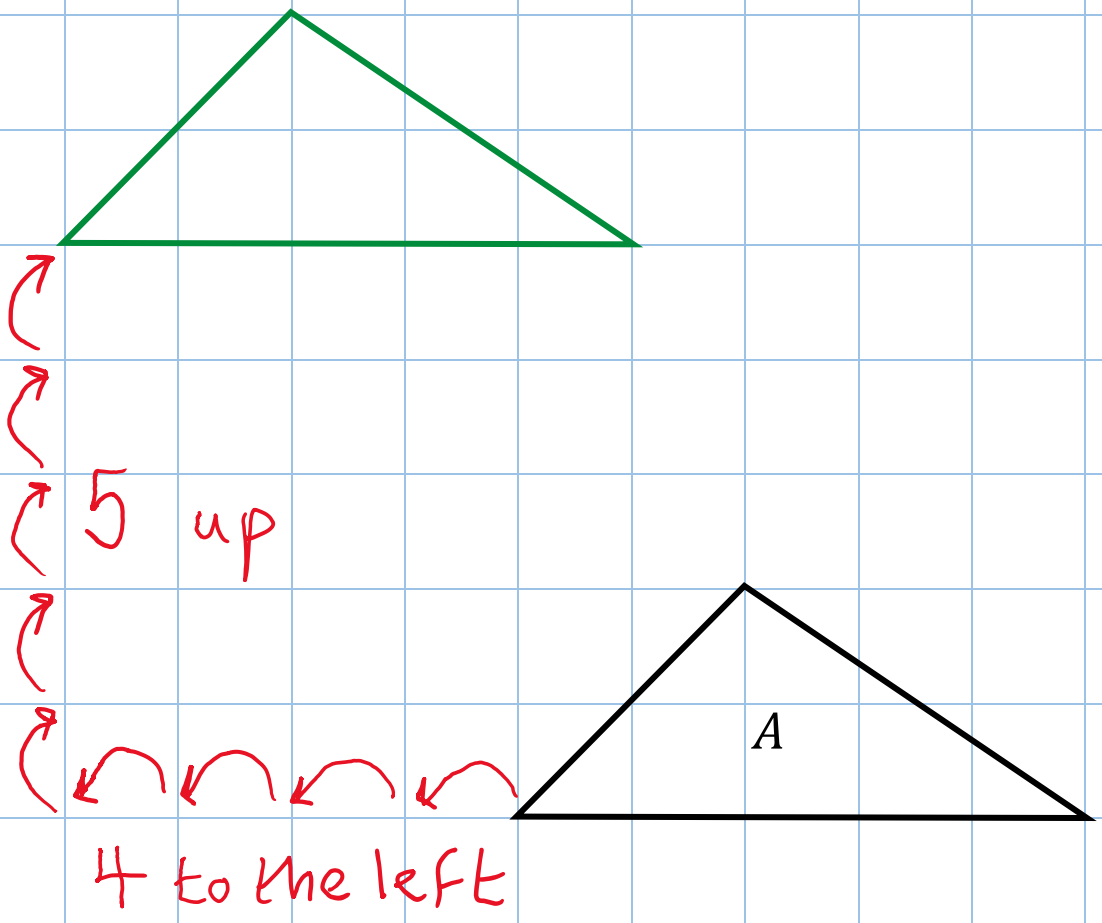
Quiz 1

1) $180 - 56$	2) $360 - 125 - 67$	3) $90 - 46$
4) 4×180	5) $540 \div 5$	6) $360 - 3 \times 70$
7) List all the factors of 24	8) 9^2	9) 6^3

___ out of 9

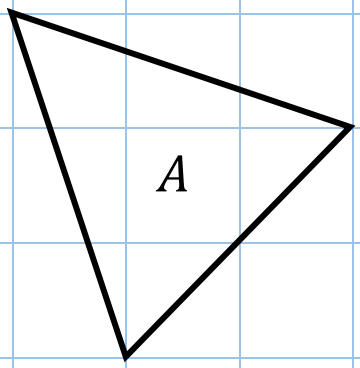
Example 1

Translate the triangle A below using the column vector $\begin{pmatrix} -4 \\ 5 \end{pmatrix}$.



Exercise 1

Translate the triangle A below using the column vector $\begin{pmatrix} 3 \\ -6 \end{pmatrix}$.



___ out of 2

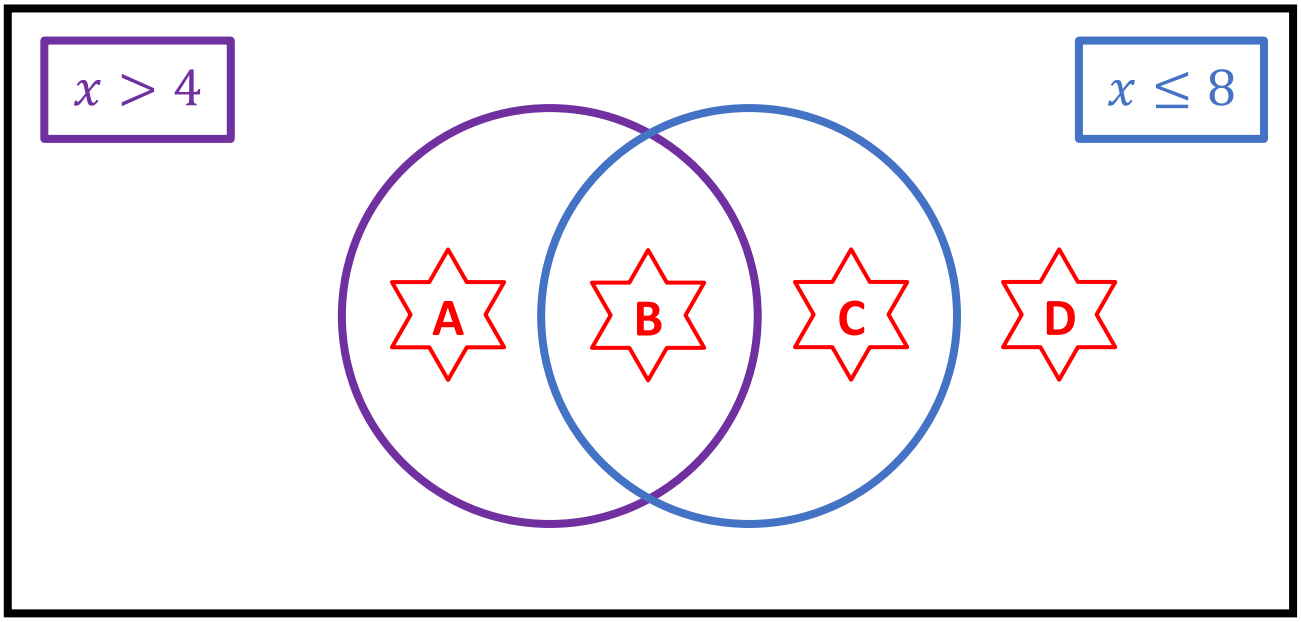
Quiz 2

Solve the following inequalities.

1) $x + 3 > 8$	2) $x - 5 \leq 9$	3) $\frac{x}{2} \geq 8$
4) $4x > 20$	5) $-4x > 20$	6) $4x > -20$
7) $2x - 1 > 21$	8) $20 < 3x + 5$	9) $3 - 2x < 13$

___ out of 9

Venn Diagram Challenge 1



Think of a number that could go into each region.
If you think a region is impossible to fill, explain why!

A

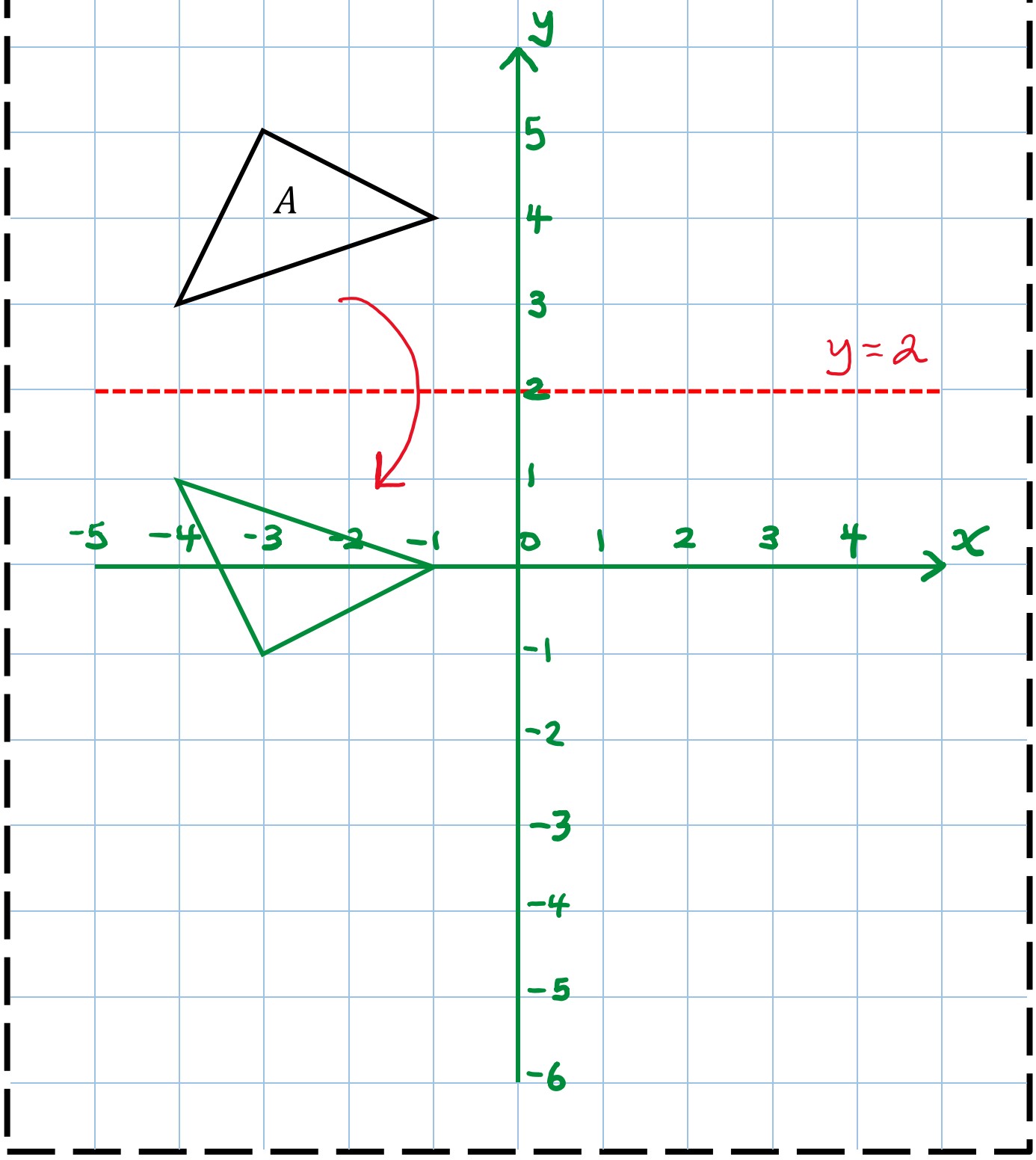
B

C

D

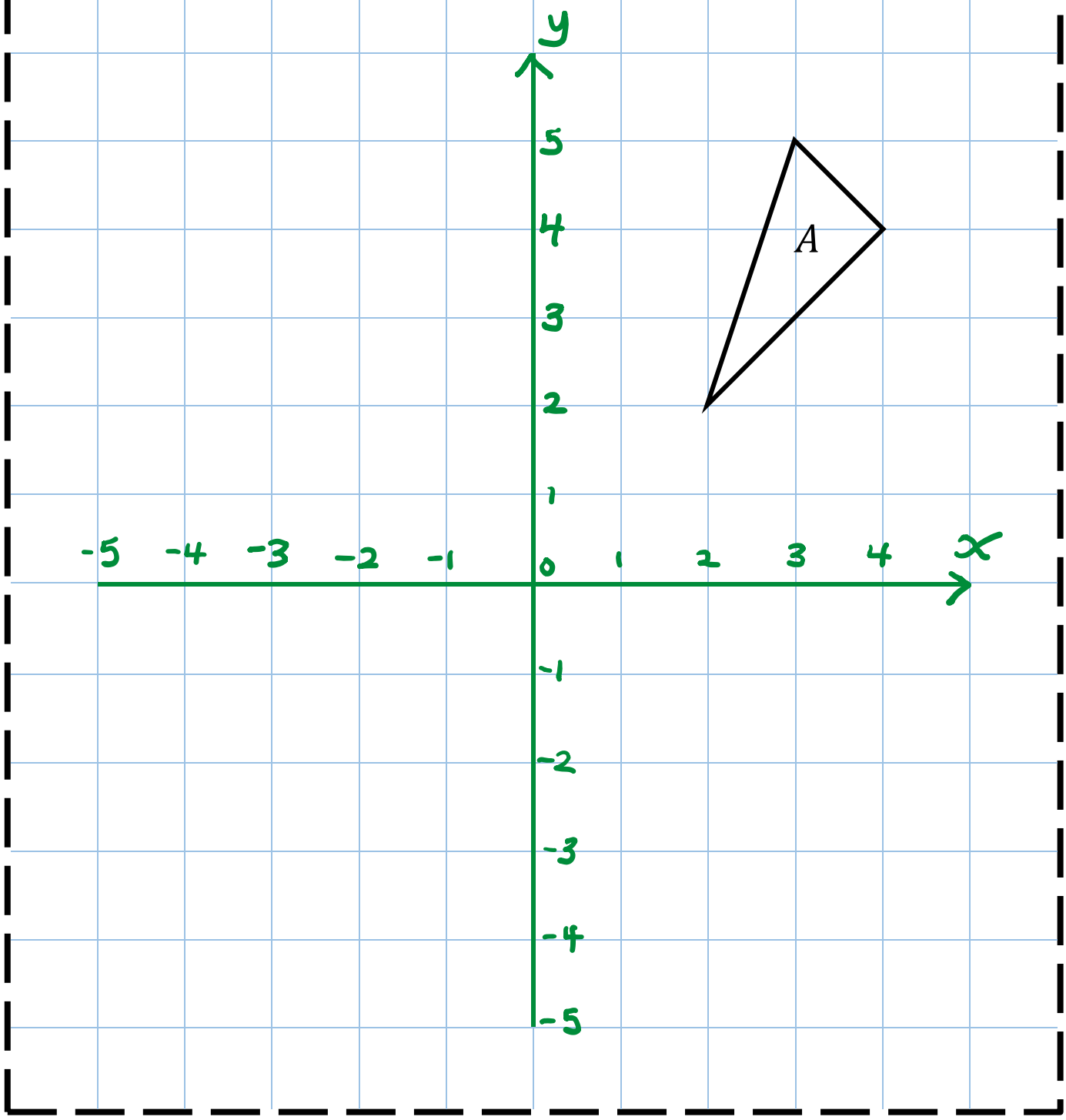
Example 2

Reflect the triangle A in the line $y = 2$.



Exercise 2

Reflect the triangle A in the line $x = 1$.

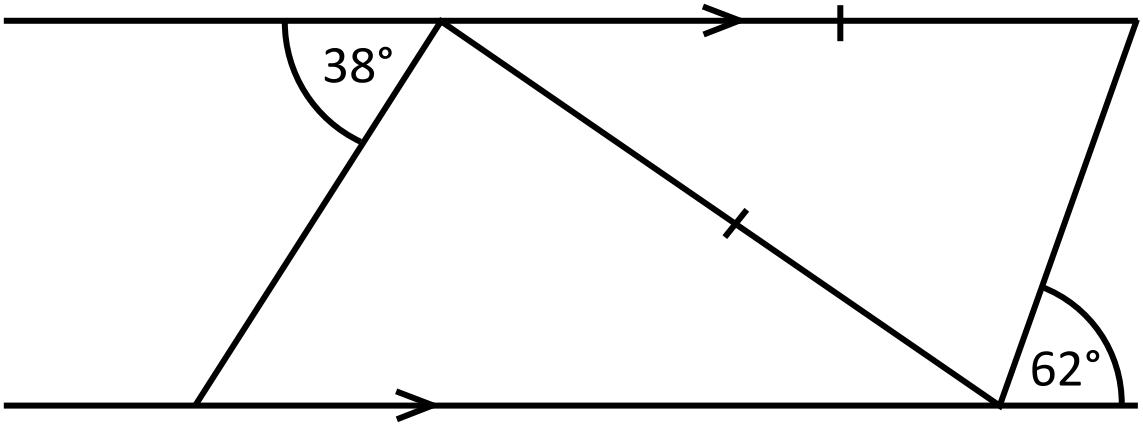


___ out of 2

Quiz 3

1) $\frac{2}{9} + \frac{4}{9}$	2) $\frac{7}{8} - \frac{3}{8}$	3) $\frac{2}{5} + \frac{1}{3}$
4) $\frac{2}{5} - \frac{1}{3}$	5) $\frac{2}{5} \times \frac{1}{3}$	6) $\frac{2}{5} \div \frac{1}{3}$
7) $3\frac{2}{7}$ as a top-heavy fraction	8) $\frac{7}{2}$ as a mixed number	9) $\frac{5}{6}$ of £42

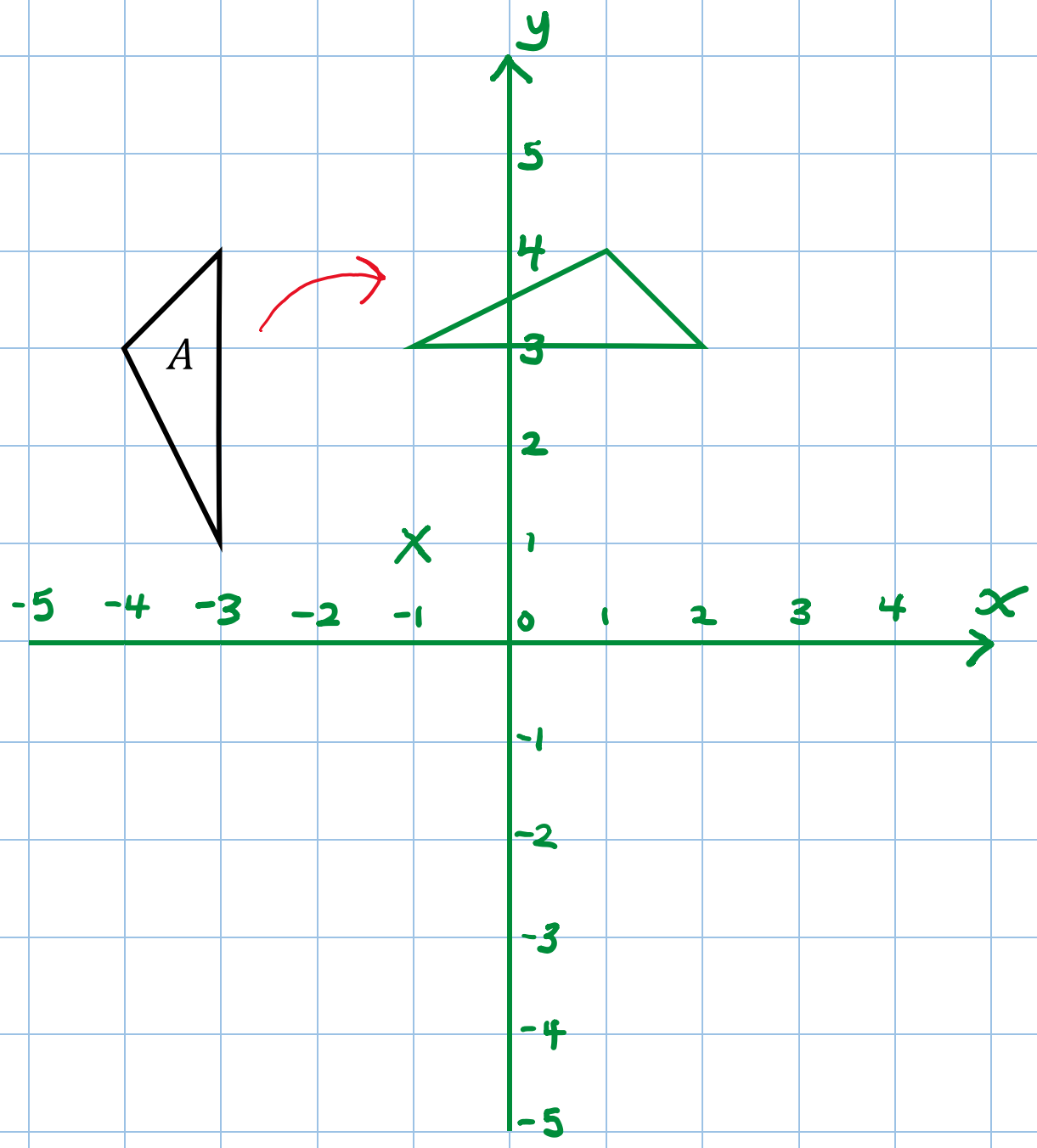
Angle Chase



Which angles can be found in this diagram?

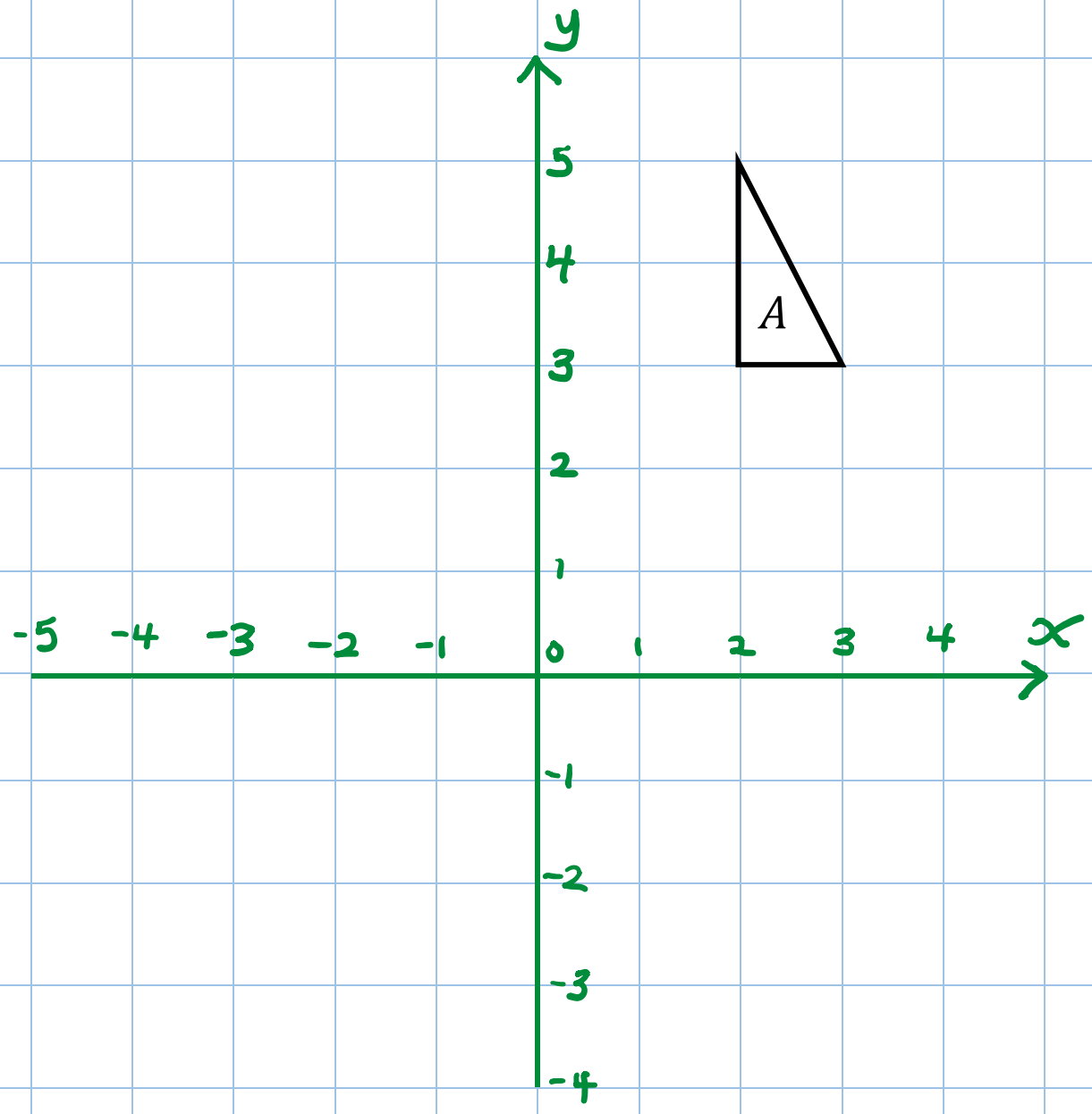
Example 3

Rotate the triangle A 90° clockwise around the point (–1, 1).



Exercise 3

Rotate the triangle A 90° anticlockwise around the point (1, 2).



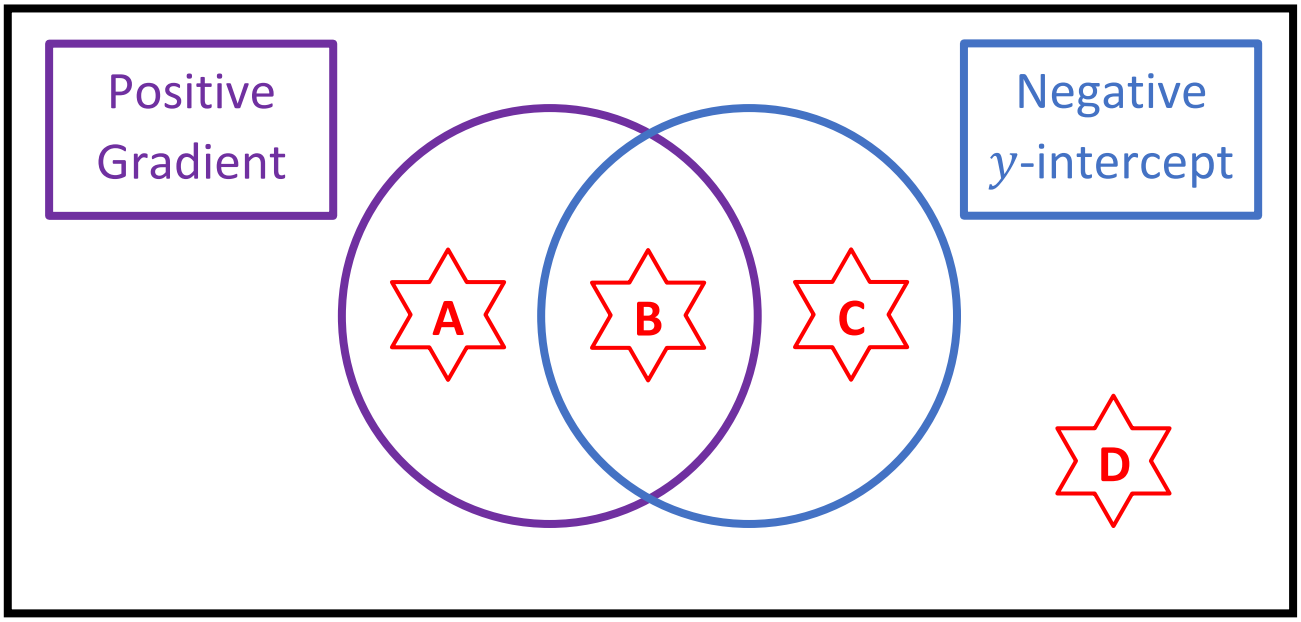
___ out of 2

Quiz 4

1) 10% of £54	2) 25% of £40	3) 20% of $9
4) 3.4 + 2.48	5) 3.4 – 2.48	6) 3 ÷ 0.5
7) Find the mode of 5, 2, 8, 4, 5, 6	8) Find the median of 5, 2, 8, 4, 5, 6	9) Find the mean of 5, 2, 8, 4, 5, 6

___ out of 9

Venn Diagram Challenge 2



Write an equation of the form $y = mx + c$ that could go into each region. If you think a region is impossible to fill, explain why!

A

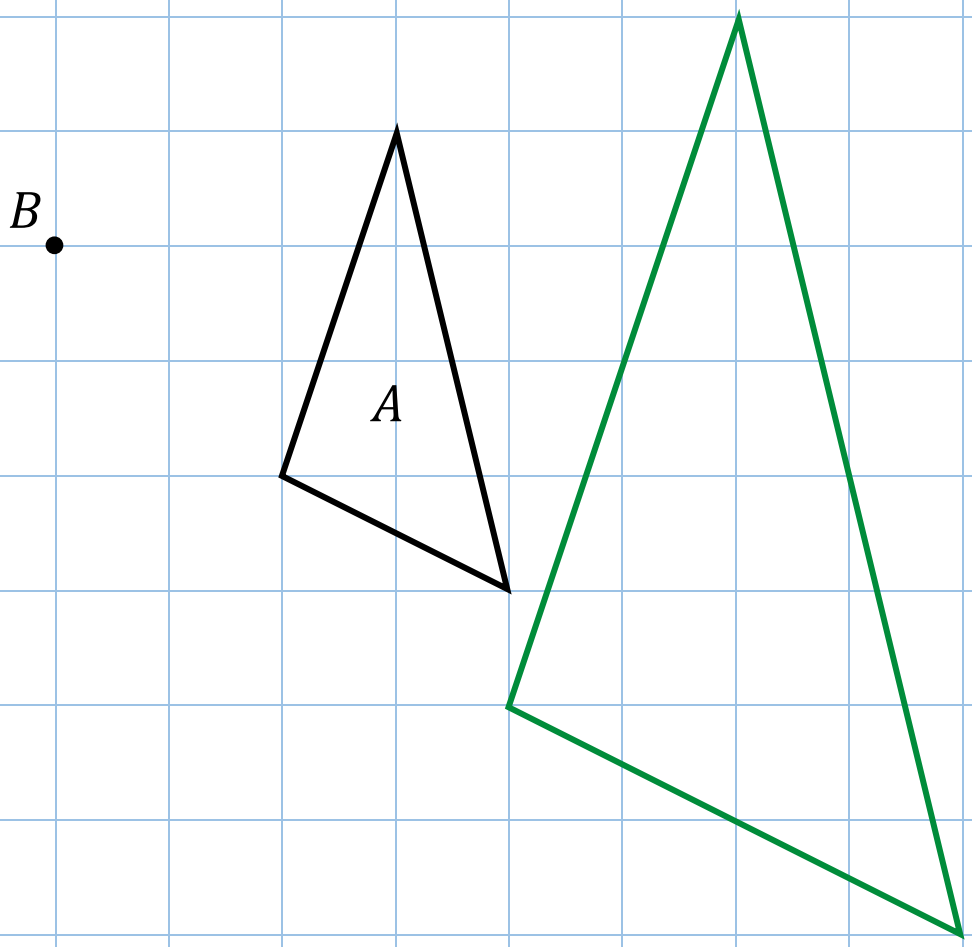
B

C

D

Example 4

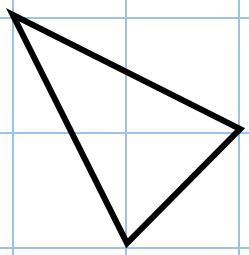
Enlarge the triangle A using scale factor 2 and centre of enlargement B.



Exercise 4

Enlarge the triangle A using scale factor 2 and centre of enlargement B.

B



___ out of 3

Quiz 5

Sketch the following shapes.

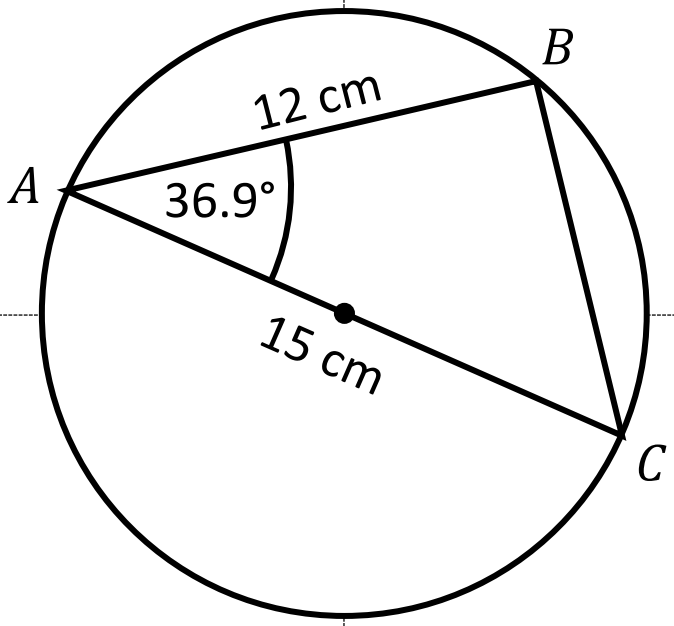
1) Rectangle	2) Triangle	3) Parallelogram
4) Trapezium	5) Kite	6) Arrowhead
7) Cuboid	8) Sphere	9) Tetrahedron

___ out of 9

Triangle in a Circle

1) What is the size of the angle $A\hat{B}C$?

2) What is the size of the angle $B\hat{C}A$?



3) What is the length of the circumference of the circle?

4) What is the length of the line BC?

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Evaluating the Workbook

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Contents

Quiz 1

1) $\frac{2}{7} + \frac{3}{7}$	2) $\frac{2}{7} \times \frac{3}{7}$	3) $1 - \frac{3}{7}$
4) 0.2 + 0.3	5) 0.2 × 0.3	6) 1 – 0.3
7) 25% + 10%	8) 25% × 10%	9) 1 – 10%

___ out of 9

Example 1

Calculate the size of the interior angle of any regular nonagon.

Total Interior Angles

$= 180°(n-2)$

$= 180°(9-2)$

$= 180° \times 7$

$= 1260°$

$180 \times 7 = 1260$

One interior angle of a regular nonagon

$= 1260° \div 9$

$= \underline{\underline{140°}}$

$9 \overline{)1260} = 140$

OR

One exterior angle $= 360° \div 9$

$= 40°$

One interior angle $= 180° - 40°$

$= \underline{\underline{140°}}$

Exercise 1

Calculate the size of the interior angle of any regular decagon.

___ out of 3

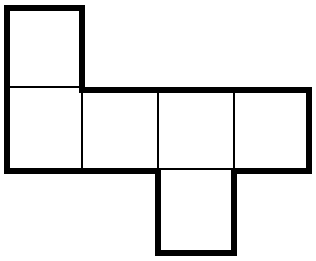
Quiz 2

1) List all the factors of 30.

2) Is the number $3^4 \times 5^2 \times 7^6$ a square number?

3) Solve $3x - 4 = 23$

4) Is the following a net of a cube?



5) What is the mode of the numbers 5, 2, 9, 4, 6, 1, 4, 9, 5, 2, 7, 9?

6) Simplify $2a + 6b + 4a - 2b$

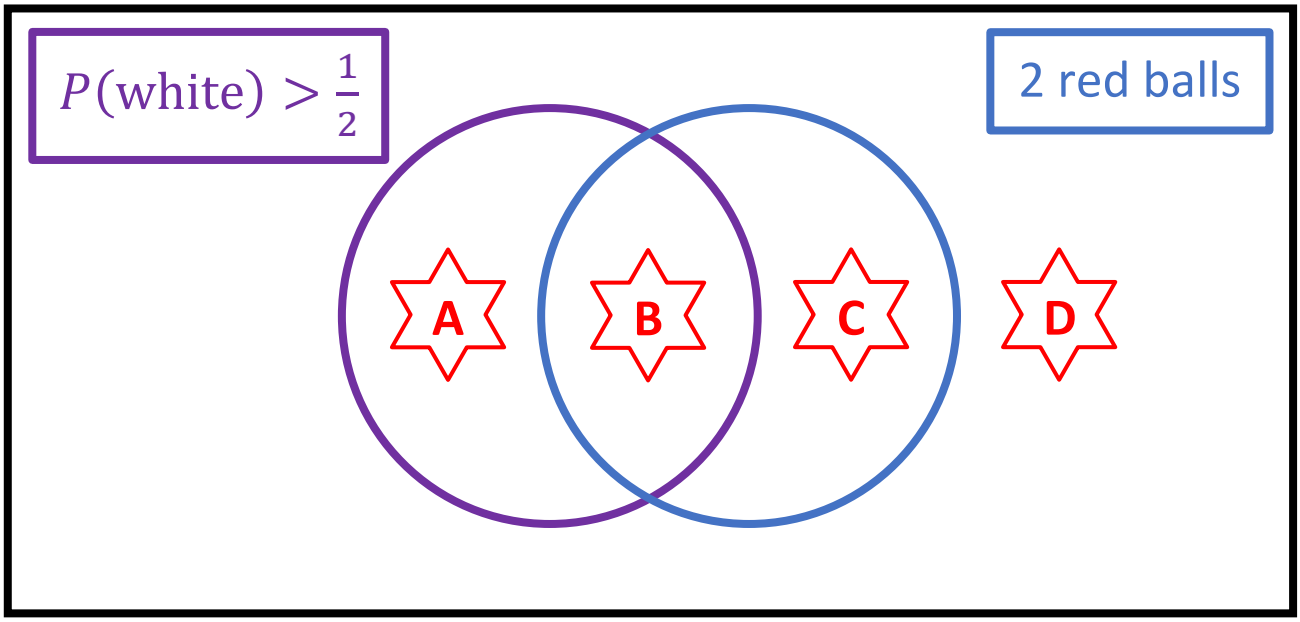
7) What is the area?

8) What is the perimeter?

9) What is the volume of a cube with 4 cm edges?

___ out of 9

Venn Diagram Challenge 1



A bag contains 10 red, green and white balls – but how many of each colour? Complete the details below, and if you think a region is impossible to fill, explain why!

A

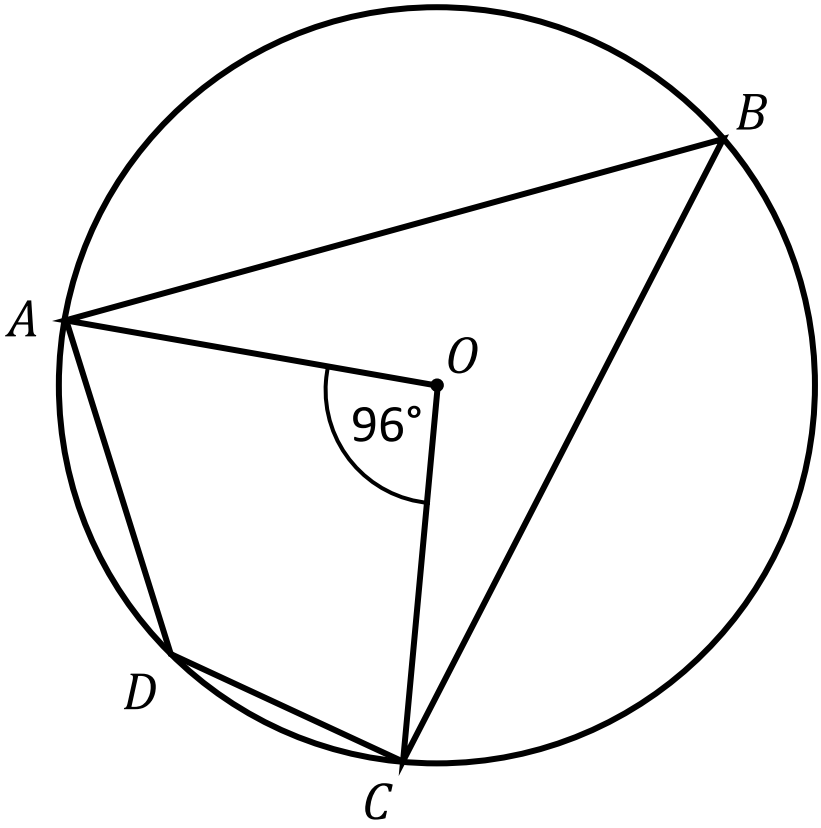
B

C

D

Example 2

Calculate the size of the angles $A\hat{B}C$ and $A\hat{D}C$.



The angle in the centre of a circle is twice the angle on the circumference so $A\hat{B}C = 96° \div 2$

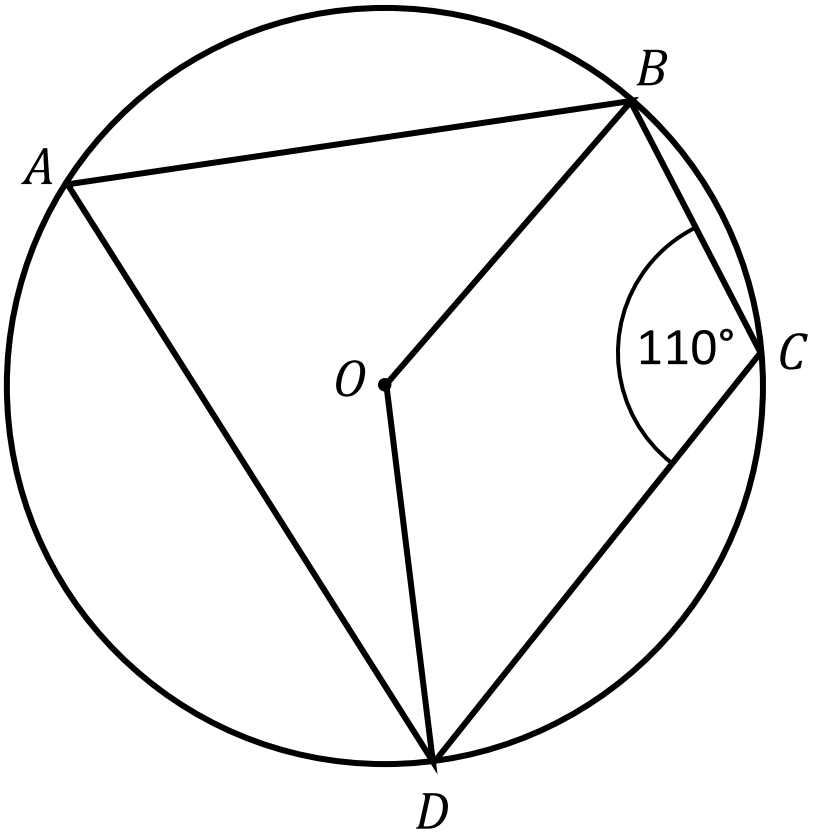
$= 48°$

Opposite angles in a cyclic quadrilateral sum to 180° so $A\hat{D}C = 180° - 48°$

$= 132°$

Exercise 2

Calculate the size of the angles $D\hat{A}B$ and $D\hat{O}B$.

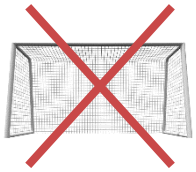


___ out of 2

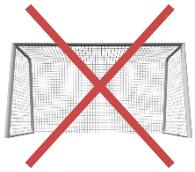
Quiz 3

1) Share £48 between Deio and Cai according to the ratio 5 : 3.	2) What is the reciprocal of 7?	3) What is the formula for calculating the area of a circle?
4) What is the nth term of the sequence 9, 11, 13, 15, ...?	5) The median of 9, 2, 1, 6, 8	6) Solve $\frac{x}{2} + 1 = 7$
7) Expand $4(x - 4)$	8) 10^2	9) $5 - 2.67$

___ out of 9



Counters in a Bag



Myrddin has some counters in a bag. 3 of the counters are red, and 7 of the counters are blue. The rest of the counters are green.

Myrddin randomly chooses one counter from the bag.

The probability that Myrddin's counter is green is $\frac{2}{7}$.

What can you calculate using this information?

Example 3

Find the nth term of the sequence 4, 15, 30, 49, 72.

Second difference +4 +4 +4

First difference +11 +15 +19 +23

Original Sequence 4, 15, 30, 49, 72

$4 \div 2 = 2$

n^2 1, 4, 9, 16, 25

$2n^2$ 2, 8, 18, 32, 50

Sequence $-2n^2$ 2, 7, 12, 17, 22

+5 +5 +5 +5

The nth term of the linear sequence is $5n - 3$

The nth term of the quadratic sequence is

$$2n^2 + 5n - 3$$

Exercise 3

Find the nth term of the sequence 9, 20, 37, 60, 89.

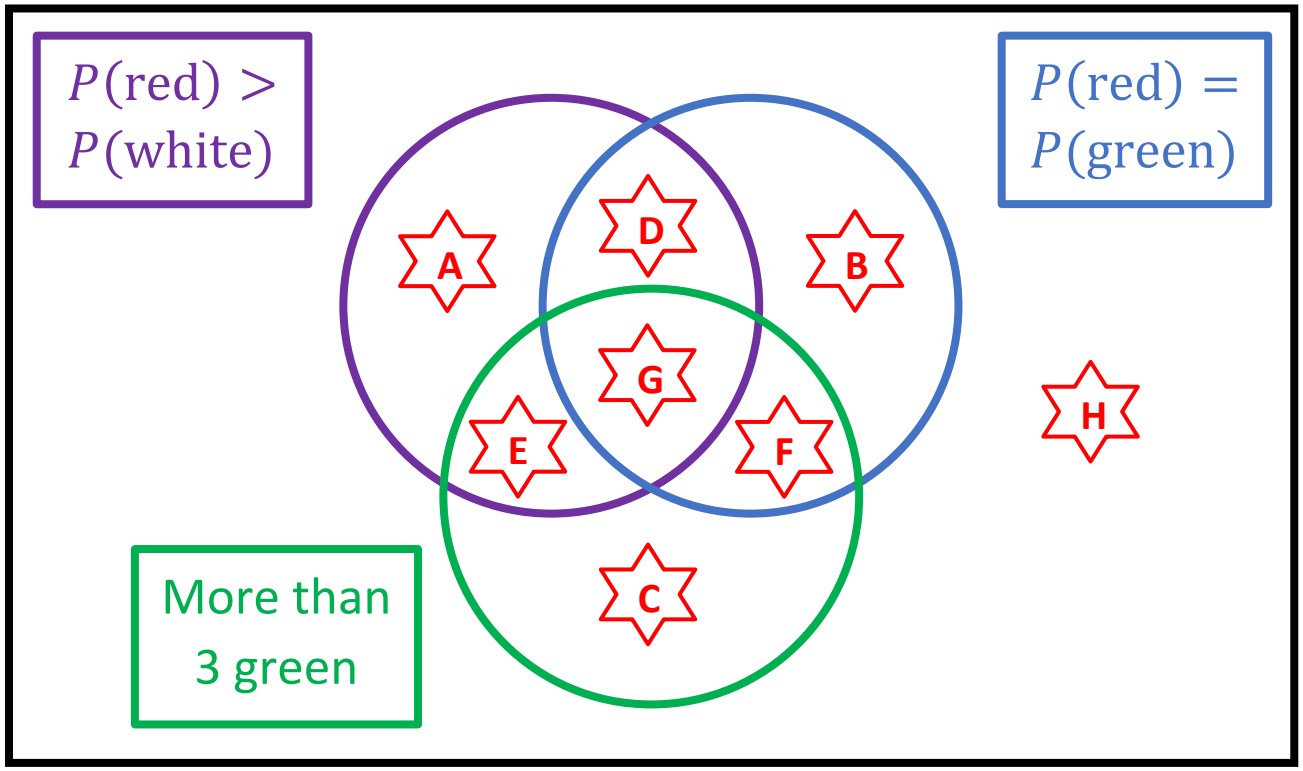
___ out of 4

Quiz 4

1) Write the time 9:45 pm using the 24-hour clock.	2) What type of angle is the angle 175°?	3) 5^3
4) The mean of 9, 7, 1, 7, 6	5) The range of 9, 7, 1, 7, 6	6) What is the name of any triangle that has exactly 2 equal angles?
7) 0.037 × 10	8) Write one million in figures.	9) Calculate 30% of £80.

___ out of 9

Venn Diagram Challenge 2



A bag contains 10 red, green and white balls – but how many of each colour? Complete the details below, and if you think a region is impossible to fill, explain why!

A

B

C

D

E

F

G

H

Example 4

An aeroplane travels 192 miles in 24 minutes.
How far did it travel in 10 minutes?

	Time	Distance
	24 minutes	192 miles
÷12	2 minutes	÷12 16 miles
×5	10 minutes	×5 80 miles

Exercise 4

The mass of a string of length 24 metres is 288 grams.
What is the mass of 17 metres of the string?

___ out of 2

Quiz 5

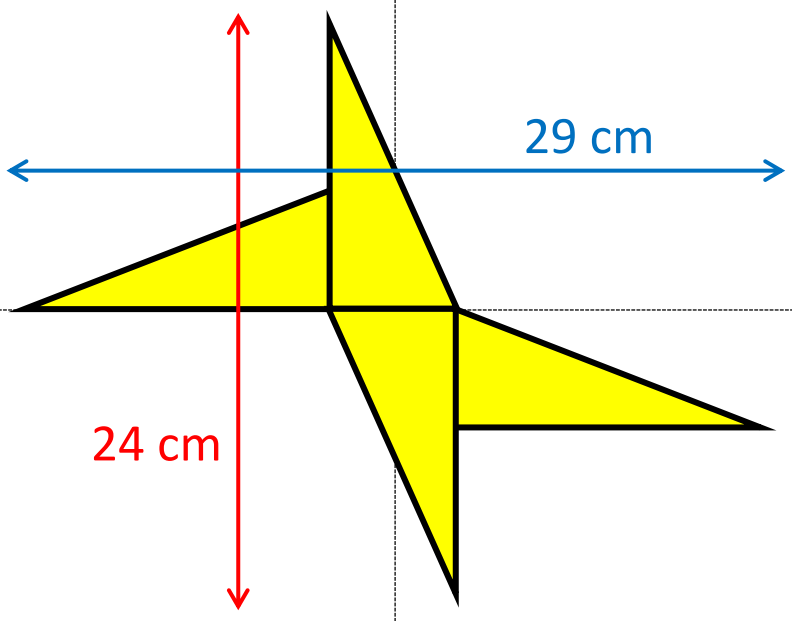
1) $8 + -2$	2) $8 - -2$	3) 8×-2
4) $-8 \div 2$	5) -8×-2	6) $-8 + 2$
7) $-8 - 2$	8) $8 \div -2$	9) 8^2

___ out of 9

The Triangular Logo

1) What is the base and height of one of the yellow triangles?

2) What is the area of one of the yellow triangles?



3) What is the length of the hypotenuse of one of the yellow triangles?

4) What is the perimeter of the triangular logo?

___ out of 8

Evaluating the Workbook

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Quiz 1

If $x = 3, y = -2, z = 5$, what is the value of:

1) $4x + 6z$	2) x^2	3) y^2
4) $3z - 7y$	5) $\frac{x+z}{2}$	6) $\frac{6}{x-1}$
7) $4z^2$	8) y^3	9) z^0

___ out of 9

Example 1

Ben shuffles a pack of standard playing cards before choosing two cards from the deck, without replacement. What is the probability that Ben's first card is hearts and his second card is black?

$$\frac{13}{52} \times \frac{26}{51} = \frac{338}{2652} \left(= \frac{13}{102}\right)$$

There are 13 hearts cards in a full pack

26 black cards are left out of a total of 51 cards

Exercise 1

Beth shuffles a pack of standard playing cards before choosing two cards from the deck, without replacement. What is the probability that Beth's first card is a 6 and her second card is a face card?

___ out of 3

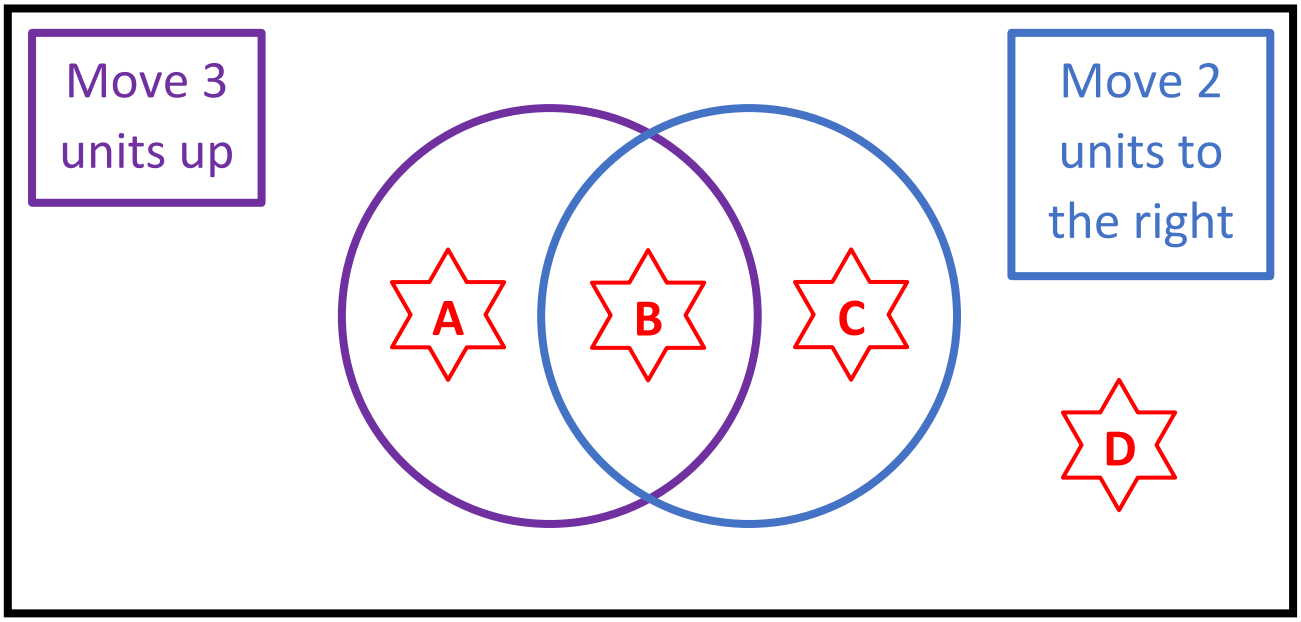
Quiz 2

Solve the following equations.

1) $x + 7 = 10$	2) $4y = 24$	3) $\frac{z}{2} = 8$
4) $2x + 1 = 15$	5) $3y - 4 = 14$	6) $x^2 = 25$
7) $\frac{x}{3} - 1 = 7$	8) $5x - 3 = 3x + 17$	9) $y^3 = 64$

___ out of 9

Venn Diagram Challenge 1



Write a function transformation for $y = f(x)$ that could fit into each region. If you think a region is impossible to fill, explain why!

A

B

C

D

Example 2

Each one of the numbers 1, 2, 4 and 8 are written on cards. Two out of the four cards are randomly chosen, without replacement. Find the probability that the product of the two chosen numbers is 8.

1ST CARD \ 2ND CARD	1	2	4	8
1	X	2	4	(8)
2	2	X	(8)	16
4	4	(8)	X	32
8	(8)	16	32	X

Answer: $\frac{4}{12}$ (or $\frac{1}{3}$)

Exercise 2

Each one of the numbers 3, 6, 9 and 12 are written on cards. Two out of the four cards are randomly chosen, without replacement. Find the probability that the sum of the two chosen numbers is greater than 12.

___ out of 4

Quiz 3

1) What is the reciprocal of 9?	2) $\frac{3}{4} + \frac{4}{5}$	3) The range of 8, 2, 9, 4, 8.
4) 20% of £58	5) 1 – 0.16	6) 0.1 × 47
7) How many edges does a hexagon have?	8) $16^{\frac{1}{2}}$	9) Sketch a tetrahedron.

___ out of 9

Triangle ABC

ABC is a triangle.

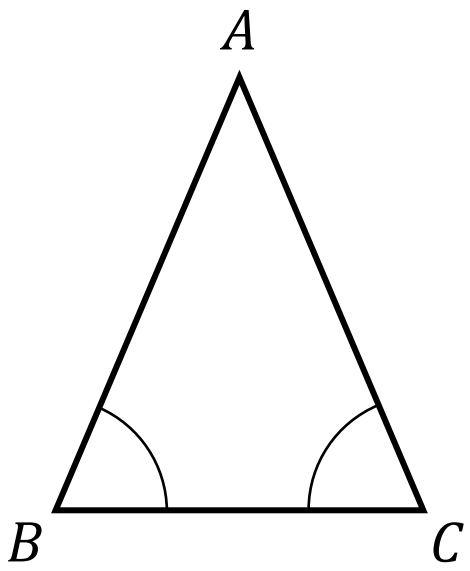
We have $A\hat{B}C = A\hat{C}B$.

Edge $AB = (3x - 5)$ cm.

Edge $AC = (19 - x)$ cm.

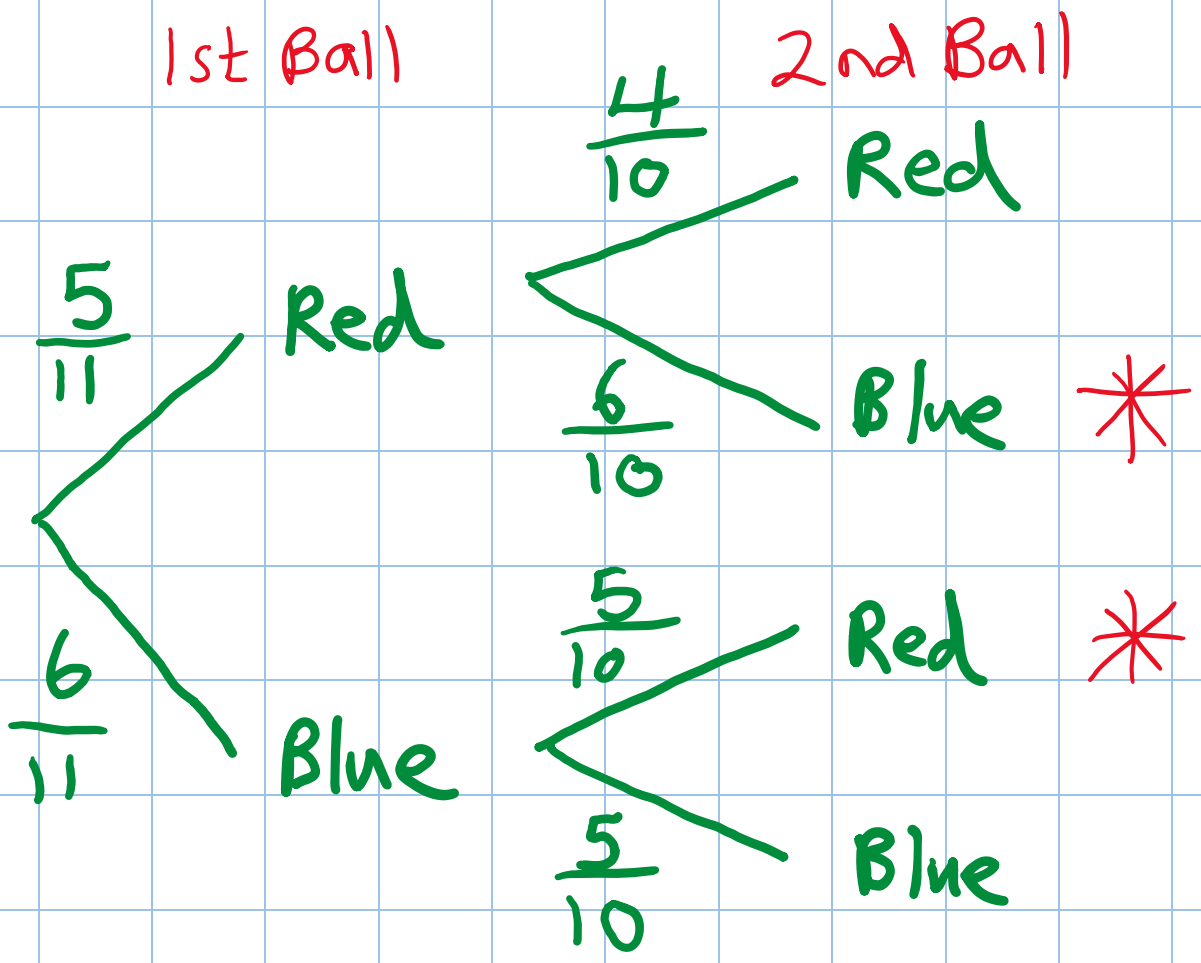
Edge $BC = 2x$ cm.

What can you calculate from this information?



Example 3

A bag contains 5 red balls and 6 blue balls. Meredith randomly chooses two balls from the bag without replacement. What is the probability that Meredith chooses one ball of each colour?



$$\frac{5}{11}\times\frac{6}{10}+\frac{6}{11}\times\frac{5}{10}=\frac{30}{110}+\frac{30}{110}$$

$$=\frac{60}{110}\quad\left(=\frac{6}{11}\right)$$

Exercise 3

A bag contains 3 red balls and 7 blue balls. Aron randomly chooses two balls from the bag without replacement. What is the probability that Aron chooses one ball of each colour?

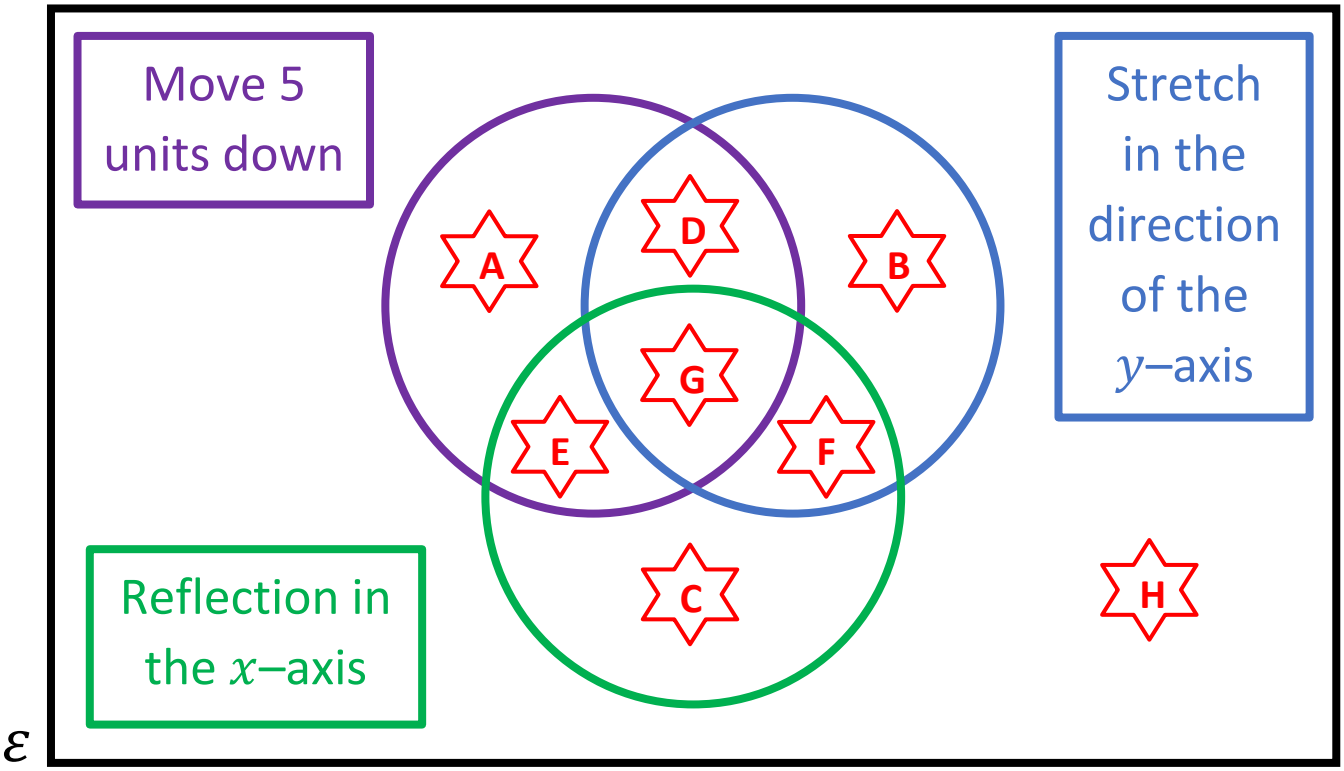
___ out of 4

Quiz 4

1) $\sin\theta =$ ———	2) $\cos\theta =$ ———	3) $\tan\theta =$ ———
4) What is the formula for calculating the area of a triangle?	5) What is the formula for calculating the area of a trapezium?	6) What is the formula for calculating the area of a circle?
7) The median of 8, 5, 9, 3, 5	8) The mode of 8, 5, 9, 3, 5	9) The mean of 8, 5, 9, 3, 5

___ out of 9

Venn Diagram Challenge 2



Write a function transformation for $y = f(x)$ that could fit into each region. If you think a region is impossible to fill, explain why!

A

B

C

D

E

F

G

H

Example 4

Solve the equation $2x^2 + 3x - 20 = 0$.

$2x^2+3x-20=0$

$2x-20=-40$

? x ? = -40
? + ? = 3

$2x^2+8x-5x-20=0$

$2x(x+4)-5(x+4)=0$

$(2x-5)(x+4)=0$

Either $2x-5=0$ or $x+4=0$

$2x=5$ $x=-4$

$x=\frac{5}{2}$

Exercise 4

Solve the equation $3x^2 - 13x + 4 = 0$.

___ out of 3

Quiz 5

1) 4^{-2}	2) What type of angle is the angle 182°?	3) What is half of 5% as a decimal?
4) Sketch an arrowhead.	5) How many faces does an open cylinder have?	6) How many days are there in November?
7) 5 – 2.164	8) Solve the equation $\frac{8}{x} = 2$.	9) Circle the prime numbers. 31 32 33 34 35 36 37 38 39

___ out of 9

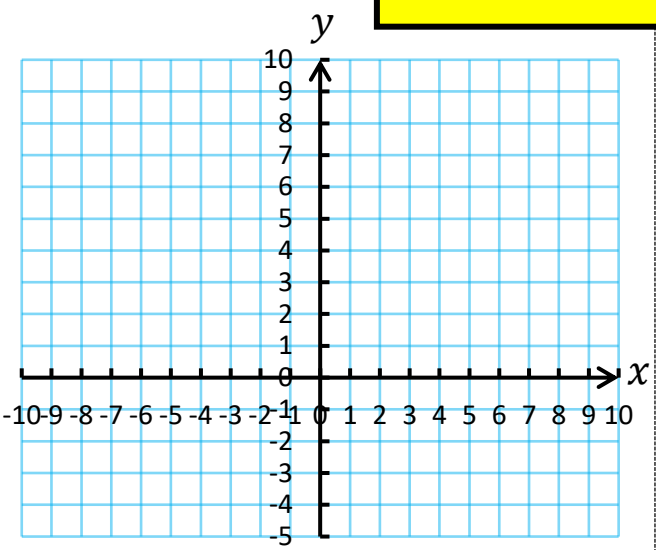
The Functions

1) Calculate $f(7)$.

2) Calculate $g(-5)$.

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

$$g(x) = 5 - 2x$$



3) Draw graphs for $f(x)$ and $g(x)$ on the graph paper.

4) For which value of x is $f(x) = g(x)$?

___ out of 8

Evaluating the Workbook

Notes

Name:

Measuring Shapes 5

Additional Tasks

Contents

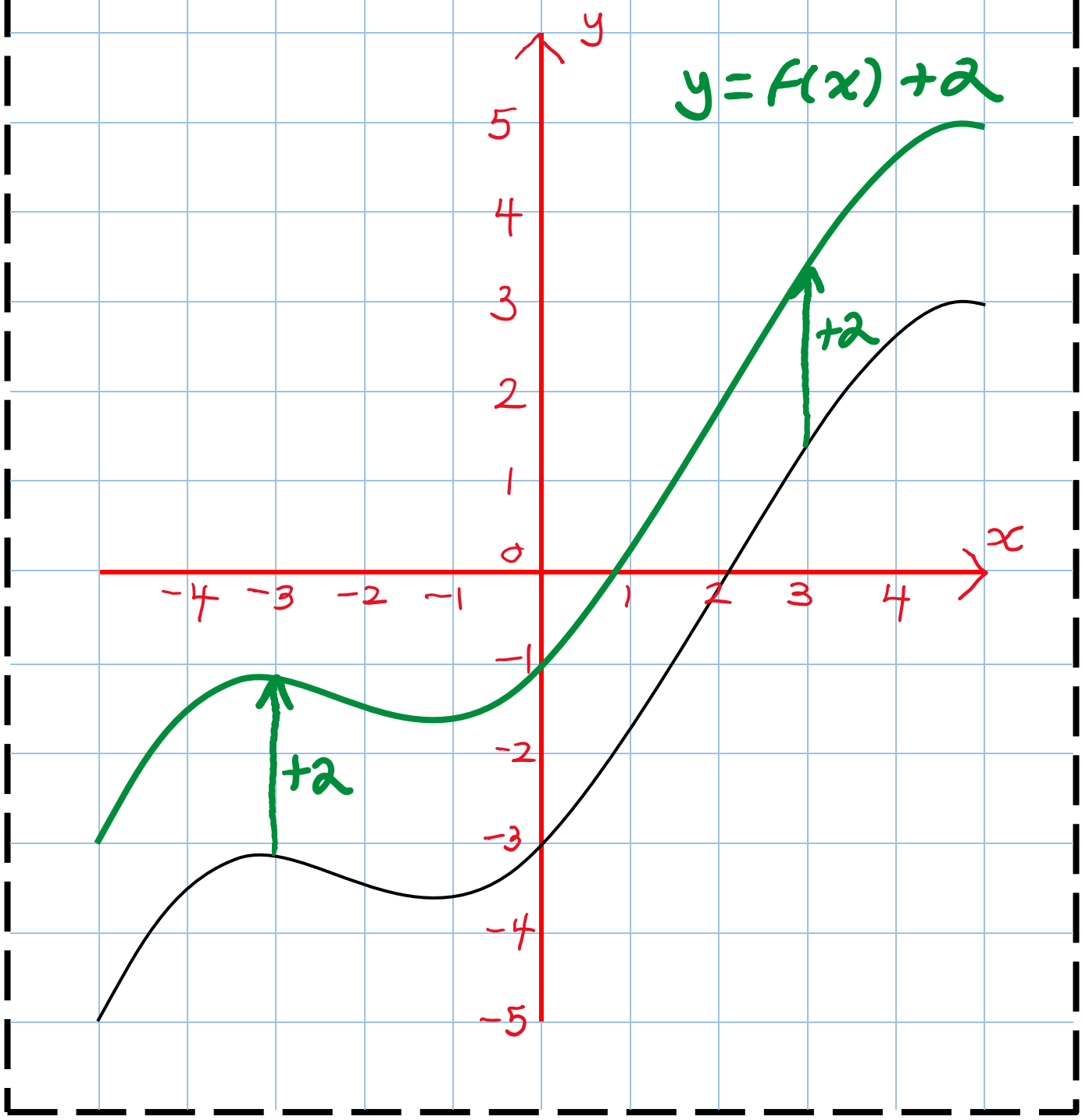
Quiz 1

1) 0.3×0.4	2) $1 - 0.4$	3) $2 \div 0.1$
4) 4^4	5) $4^{\frac{1}{2}}$	6) 4^{-2}
7) Solve $x^2 = 49$	8) Solve $\frac{x}{2} + 3 = 8$	9) Solve $x^2 + 9x + 14 = 0$

___ out of 9

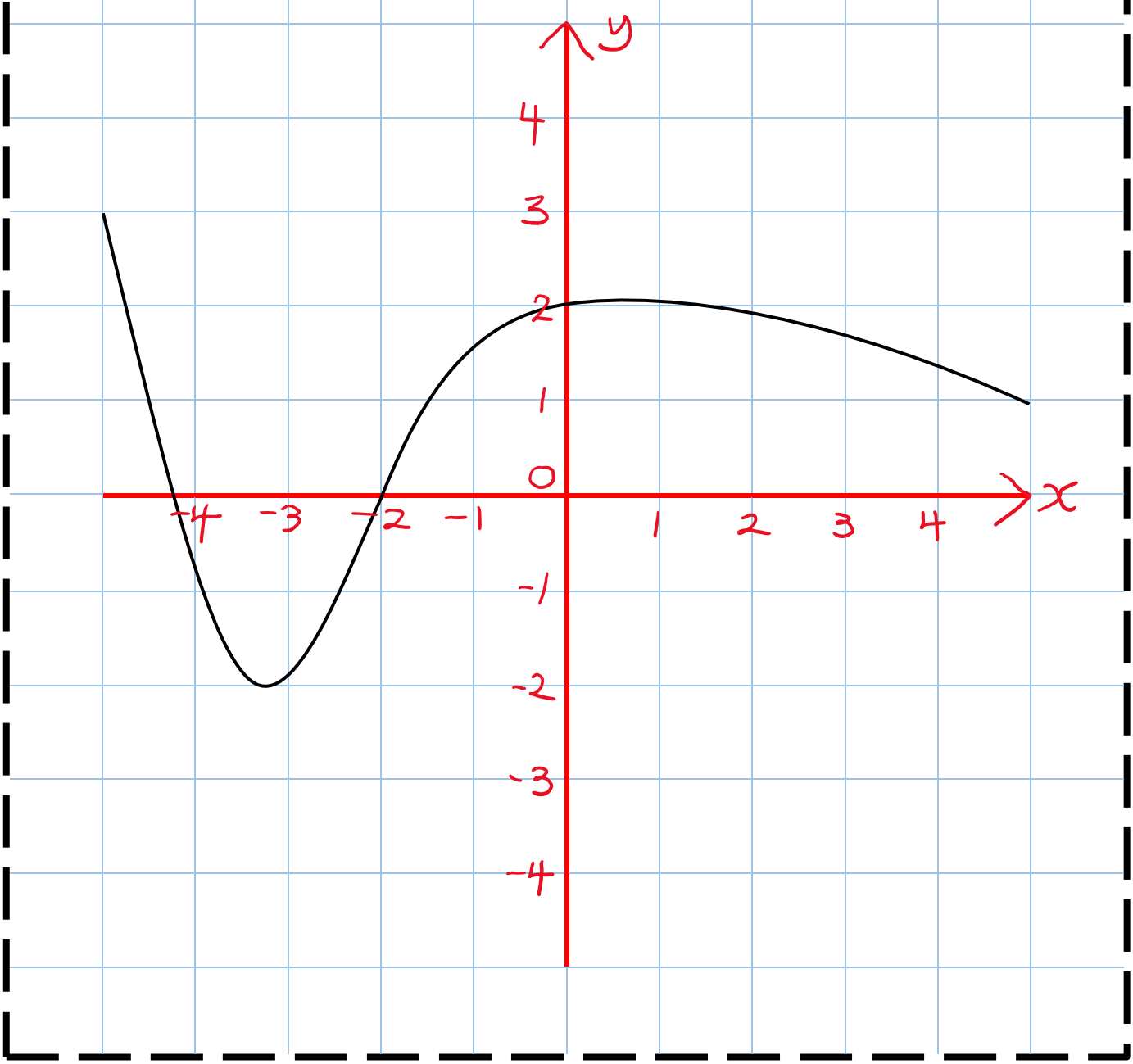
Example 1

The following graph shows the function $y = f(x)$.
Draw, on the same set of axes, the function
$y = f(x) + 2$.



Exercise 1

The following graph shows the function $y = f(x)$.
Draw, on the same set of axes, the function
$y = f(x) - 3$.



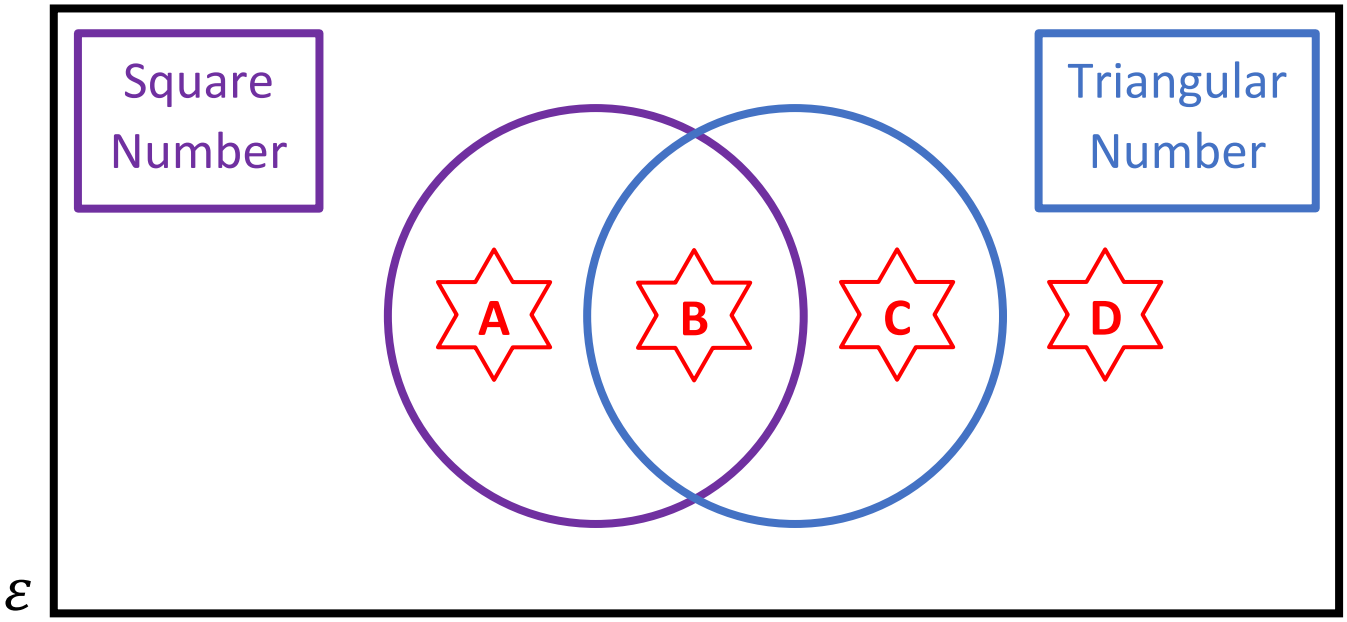
___ out of 2

Quiz 2

1) The rules for proving that two triangles are congruent are the SSS, SAS, _____ and_____ rules.	2) Solve the inequality $4x \geq 20$.	3) The gradient of a velocity-time graph gives the...
4) The height of a cupboard is 45 cm, correct to the nearest cm. What is the greatest possible height of the cupboard?	5) Write 43% as a decimal.	6) Round off 5,852 to 2 significant figures.
7) Write the reciprocal of $\frac{2}{3}$.	8) What is the least common multiple of 8 and 12?	9) $8^{\frac{2}{3}}$

___ out of 9

Venn Diagram Challenge 1



Write a number that could fit into each region. If you think a region is impossible to fill, explain why!

A

B

C

D

Example 2

Make x the subject of the formula

$$5x - 4 = 9y + xz$$

$5x - 4 = 9y + xz$

$5x - xz - 4 = 9y$ [Subtract xz]

$5x - xz = 9y + 4$ [Add 4]

$x(5 - z) = 9y + 4$ [Factorise]

$x = \frac{9y + 4}{5 - z}$ [Divide by $5 - z$]

Exercise 2

Make x the subject of the formula

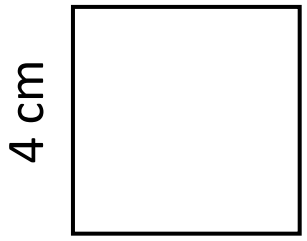
$$7x + 3 = 5z + xy$$

___ out of 3

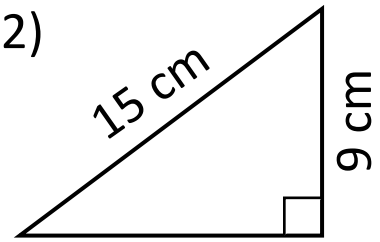
Quiz 3

Calculate the area of the following shapes.

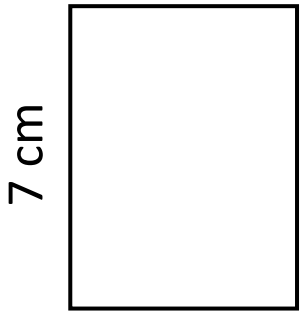
1)



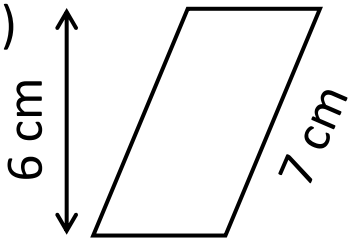
2)



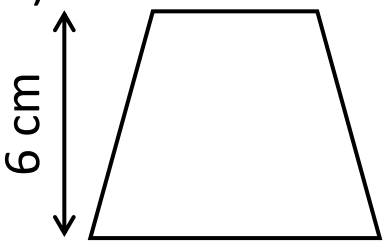
3)



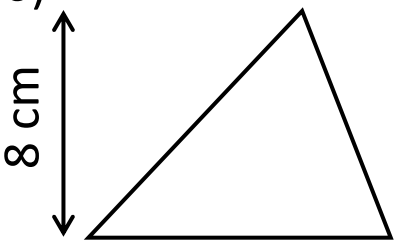
4)



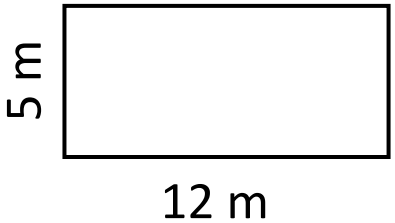
5)



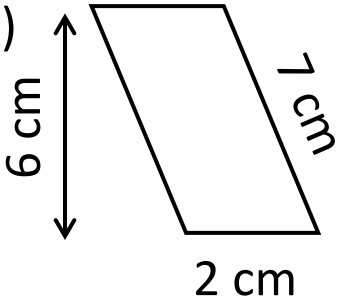
6)



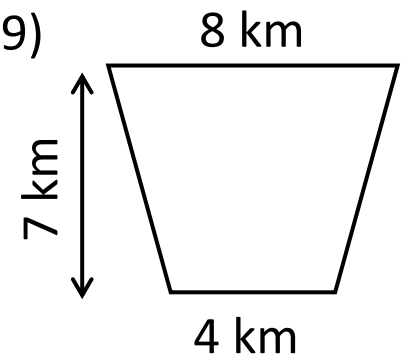
7)



8)



9)

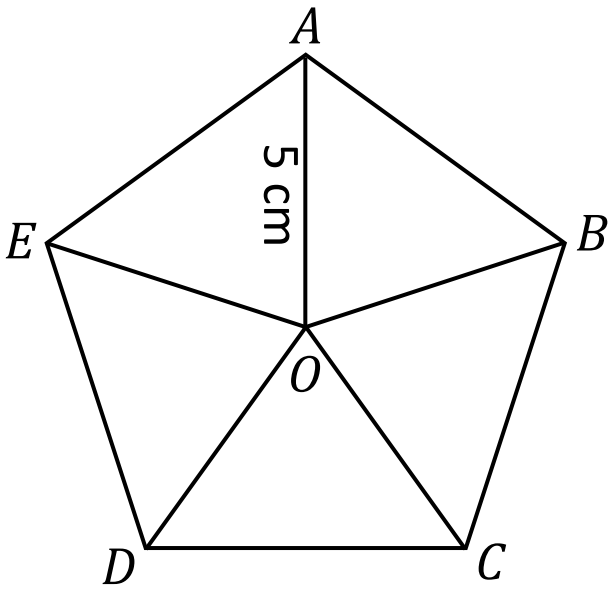


___ out of 9

The Regular Pentagon

The diagram shows a regular pentagon split into 5 congruent isosceles triangles.

What can you calculate from this information?



Example 3

Solve the equation $3x^2 - 7x + 1 = 0$.

$a = 3, b = -7, c = 1$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-7) \pm \sqrt{(-7)^2 - 4 \times 3 \times 1}}{2 \times 3}$$

$$x = \frac{7 \pm \sqrt{49 - 12}}{6}$$

$$x = \frac{7 \pm \sqrt{37}}{6}$$

Either $x = \frac{7 + \sqrt{37}}{6}$ or $x = \frac{7 - \sqrt{37}}{6}$

$x = 2.18$ to 2 decimal places

$x = 0.15$ to 2 decimal places

Exercise 3

Solve the equation $2x^2 - 4x - 3 = 0$.

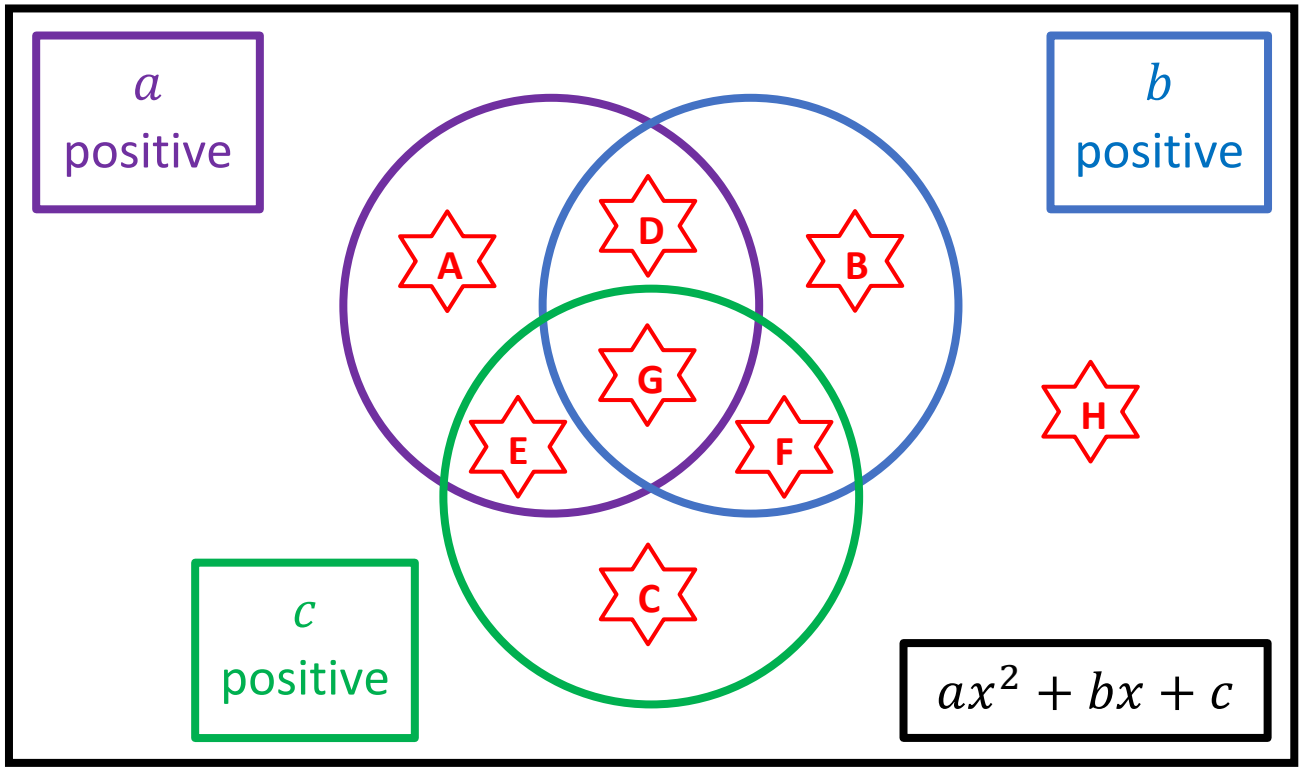
___ out of 3

Quiz 4

1) Expand $4(x + 3)$	2) Factorise $15y - 12$	3) Substitute $x = -3$ into $5 - 8x$
4) 20% of £60	5) $\frac{2}{7}$ of £35	6) 0.3 × 12
7) The range of 8, 2, –3, 9, 0	8) In which quadrant is the co-ordinate (–4, 3)?	9) Write midnight in the 24-hour clock.

___ out of 9

Venn Diagram Challenge 2



Write a pair of brackets which, after expanding, belong to each of the shown regions. If you think a region is impossible to fill, explain why!

A

B

C

D

E

F

G

H

Example 4

Write $\frac{2}{x+3} - \frac{3}{x-1}$ as a single fraction in its simplest form.

$$\frac{2}{x+3} - \frac{3}{x-1}$$

$$= \frac{2(x-1)}{(x+3)(x-1)} - \frac{3(x+3)}{(x+3)(x-1)}$$

$$= \frac{2(x-1)-3(x+3)}{(x+3)(x-1)}$$

$$= \frac{2x-2-3x-9}{(x+3)(x-1)}$$

$$= \frac{-x-11}{(x+3)(x-1)}$$

Exercise 4

Write $\frac{5}{x+2} - \frac{7}{x-3}$ as a single fraction in its simplest form.

___ out of 3

Quiz 5

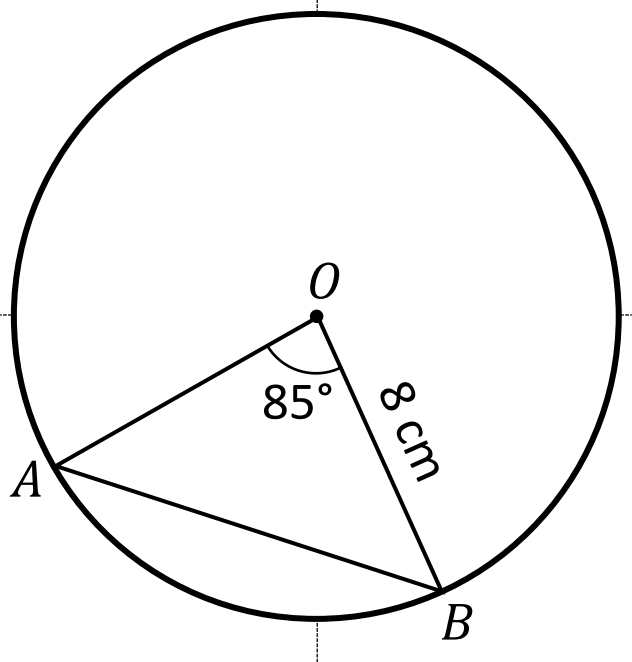
1) Total angles in a triangle = _____°	2) Estimate the value of $\frac{293\times41.5}{5.99}$.	3) Write 4,340,000 in standard form.
4) What is the probability of rolling a 4 on a standard fair die?	5) $\frac{2}{7}+\frac{3}{7}$	6) Write one less than one billion, in figures.
7) Write half of a quarter as a fraction.	8) Draw an angle of 73° using a protractor.	9) How many thirds form 4 whole units?

___ out of 9

Area of the Segment

1) Calculate the size of the angles $O\hat{A}B$ and $O\hat{B}A$.

2) What is the area of the triangle OAB?



3) What is the length of the chord AB?

4) What is the area of the minor segment AB?

___ out of 8

Evaluating the Workbook

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The End of Year 11

Additional Tasks

Contents

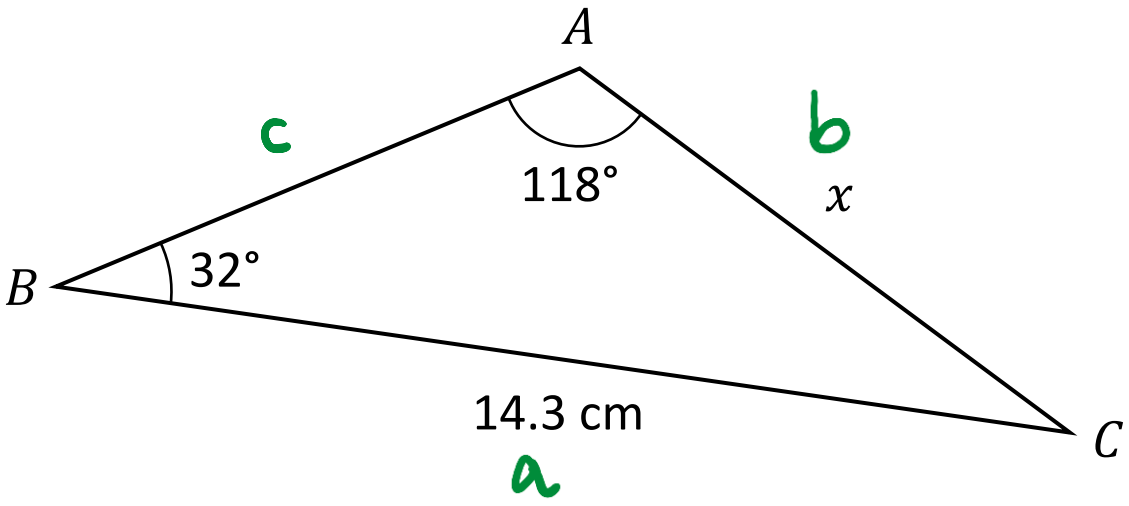
Quiz 1

1) Simplify the fraction $\frac{72}{84}$.	2) Evaluate 4^{-2}.	3) Calculate 30% of £50.
4) $\sqrt{16} \times \sqrt{36}$	5) Solve $\frac{x}{2} = 6$	6) Expand $(x + 6)(x - 3)$
7) How many edges does a nonagon have?	8) What is the sampling interval when choosing a systematic sample 7 out of 40 people?	9) The range of 7, 3, 8, 9, 4

___ out of 9

Example 1

Calculate the missing length x.



The Sine Rule:

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \cancel{\frac{c}{\sin C}}$$

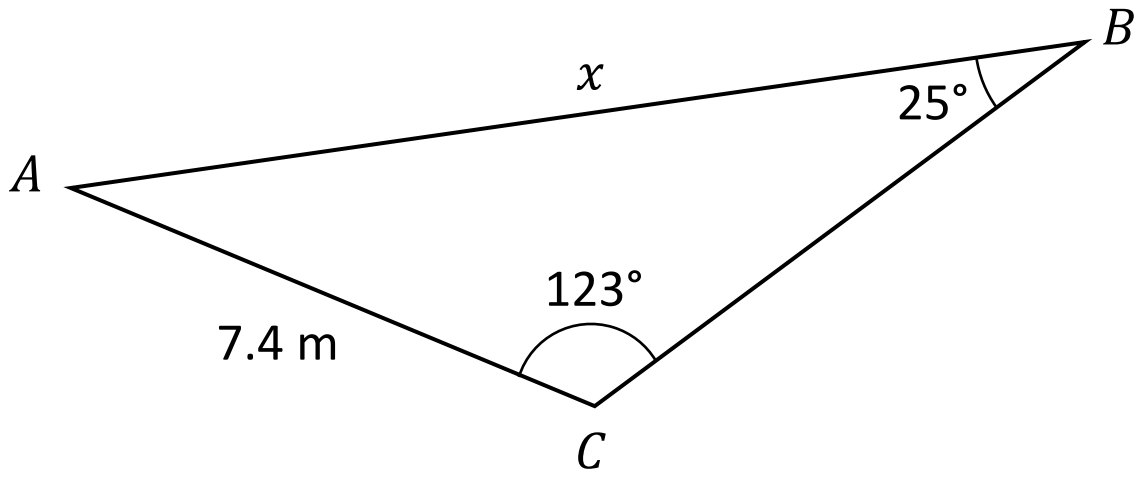
$$\frac{14.3}{\sin 118^\circ} = \frac{x}{\sin 32^\circ}$$

$$\left(\frac{14.3}{\sin 118^\circ}\right) \times \sin 32^\circ = x$$

$$x = 8.58 \text{ cm to 2 d.p.}$$

Exercise 1

Calculate the missing length x.



___ out of 3

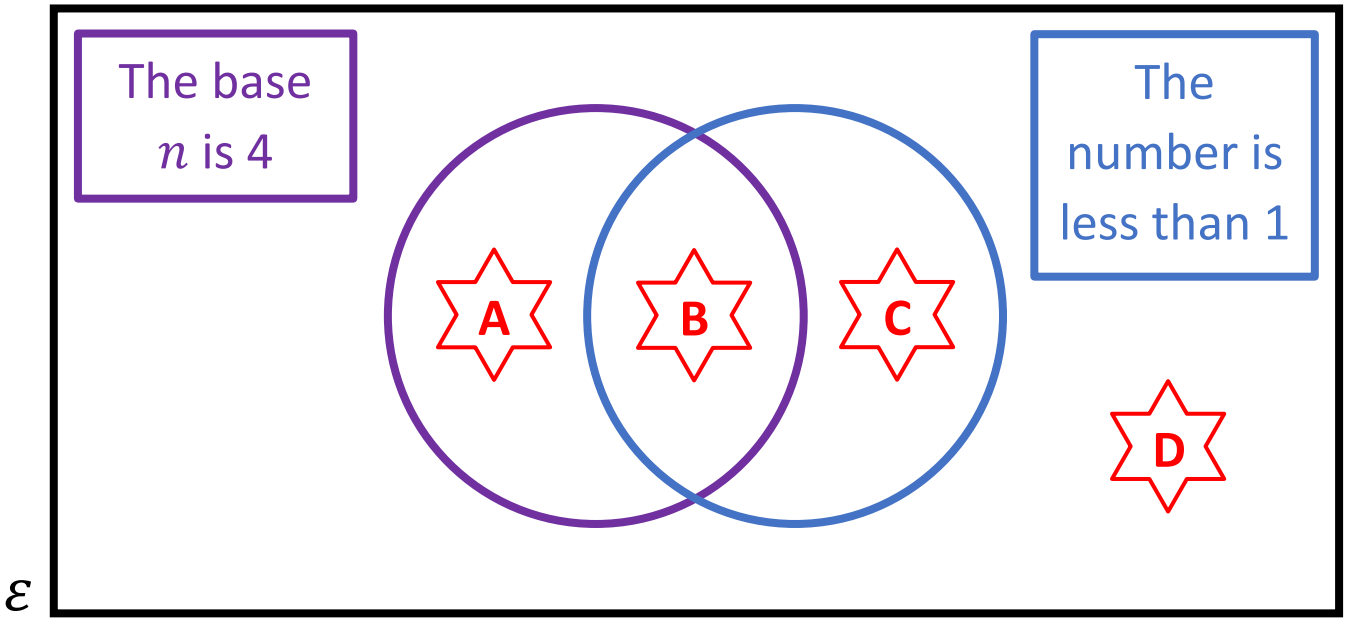
Quiz 2

What is the formula?

1) Area of a Circle =	2) Density =	3) Length of an Arc =
4) Population Density =	5) Volume of a Cuboid =	6) Area of a Trapezium =
7) Area of a Parallelogram =	8) Area of a Triangle =	9) Volume of a Sphere =

___ out of 9

Venn Diagram Challenge 1



Think of a number of the form n^a that could fit into each region.
If you think a region is impossible to fill, explain why!

A

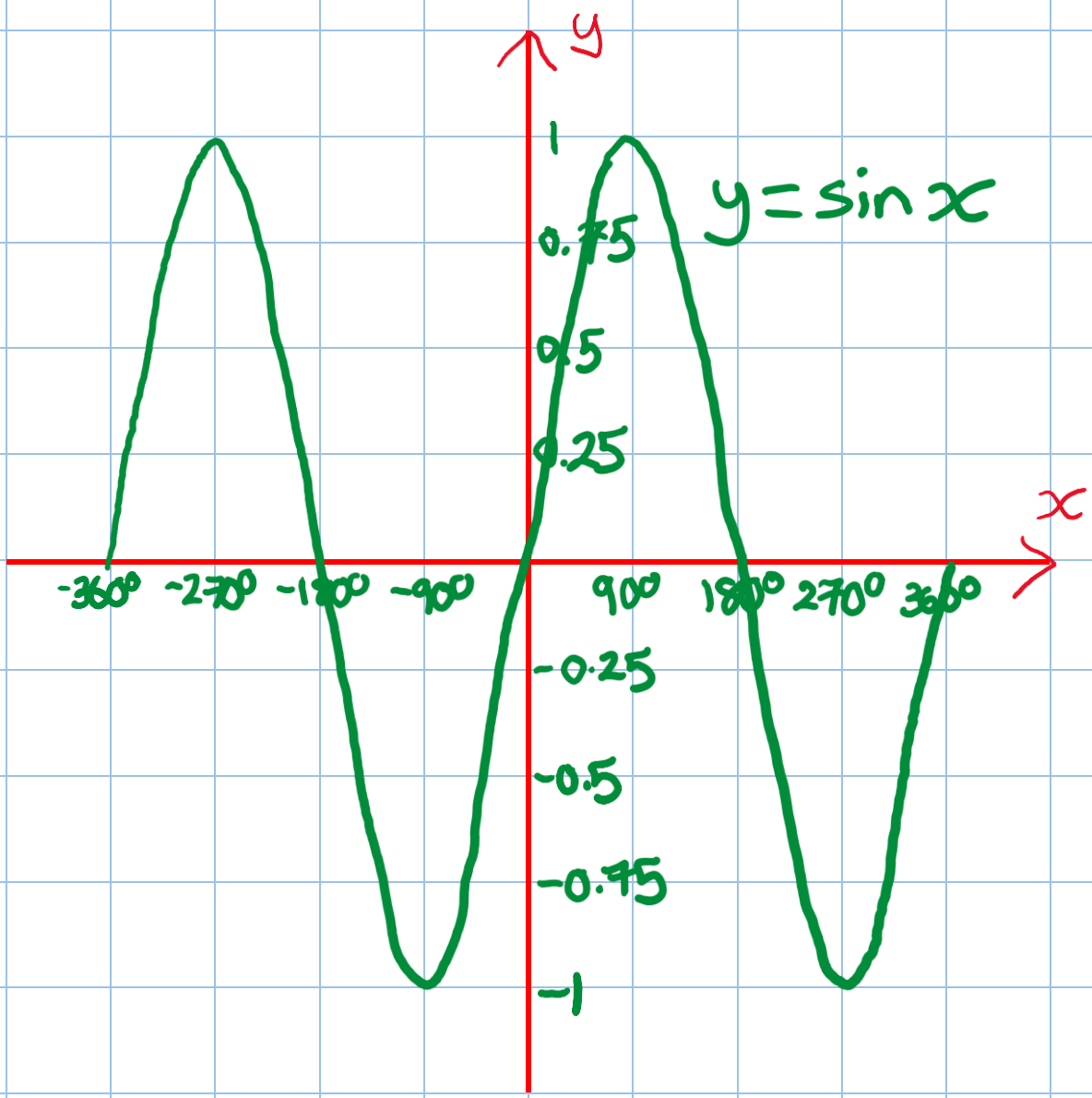
B

C

D

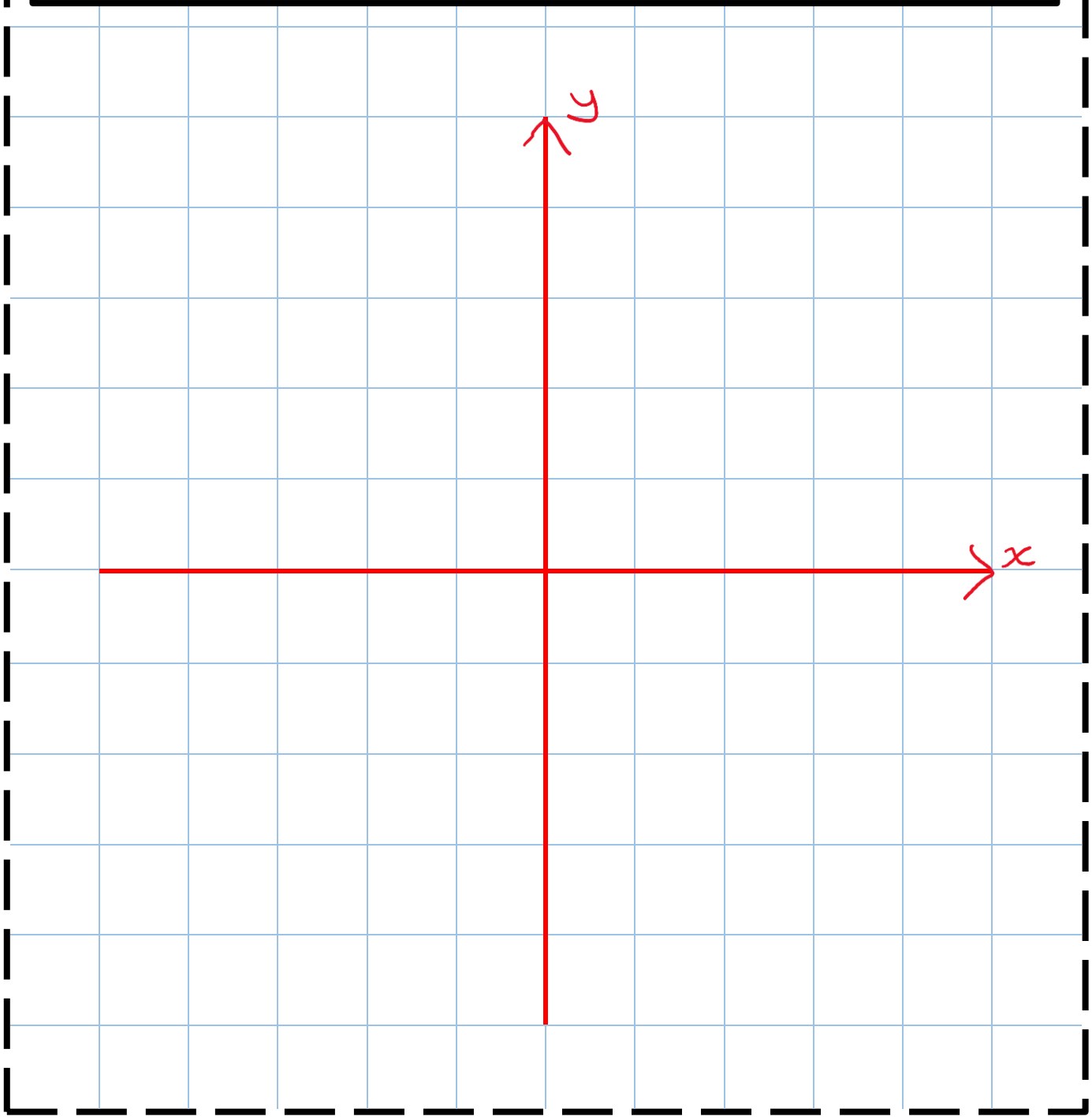
Example 2

Sketch the graph $y = \sin x$ for values of x between –360° and 360°.



Exercise 2

Sketch the graph $y = \cos x$ for values of x between $-360°$ and $360°$.



___ out of 4

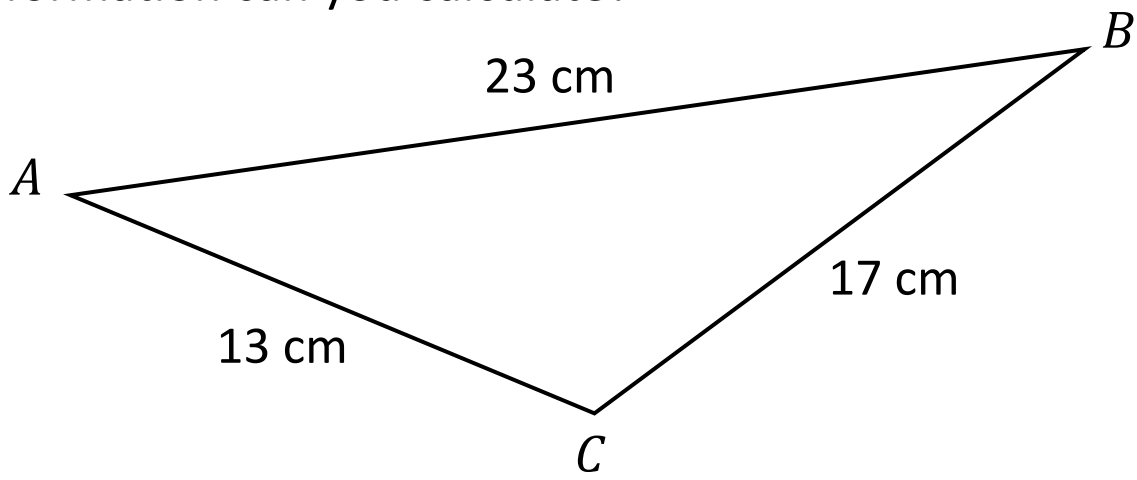
Quiz 3

8×7	$2 \div 0.5$	$4 - -3$	$18 \div -2$	$2.1 + 0.5$
9×8	$3 \div 0.25$	$2 + -7$	$-9 \div 3$	$0.3 - 0.5$
6×12	$1 \div 0.2$	$-3 + -4$	$-15 \div -3$	2.3×3
9×7	$5 \div 0.1$	$-5 - 6$	-4×3	$5 \div 10$
11×12	$3 \div 0.3$	$-2 - +3$	-8×-6	$4 - 2.6$

____ out of 25

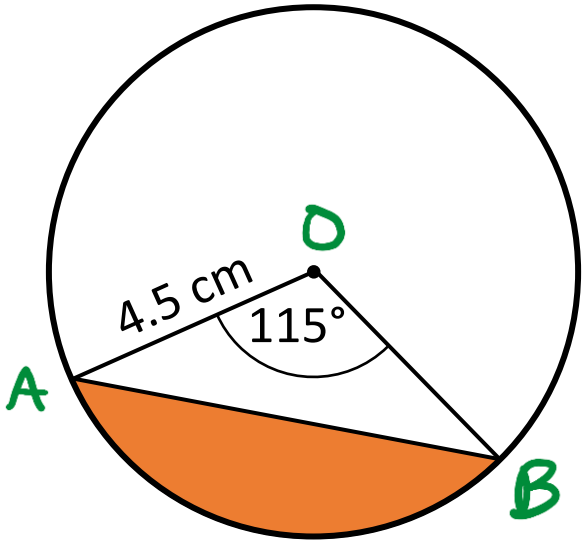
The Triangle

For the triangle shown below, what additional information can you calculate?



Example 3

What is the area of the orange segment?



Area of sector AOB

$= \frac{\theta}{360} \times \pi r^2$

$= \frac{115^\circ}{360} \times \pi \times 4.5^2$

$= 20.322177748 cm^2$

Area of triangle AOB

$= \frac{1}{2} ab \sin C$

$= \frac{1}{2} \times 4.5 \times 4.5 \times \sin 115^\circ$

$= 9.176366344 cm^2$

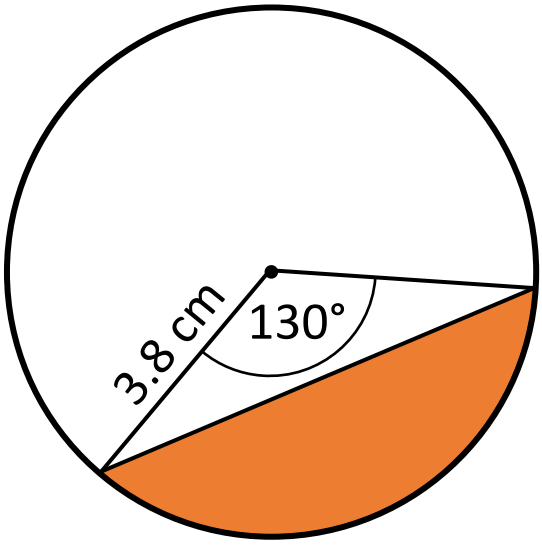
Area of the orange segment

$= 20.322177748 - 9.176366344$

$= 11.15 cm^2$ to 2 d.p.

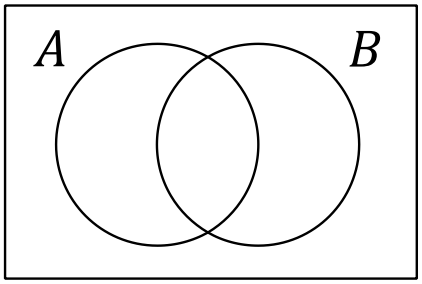
Exercise 3

What is the area of the orange segment?



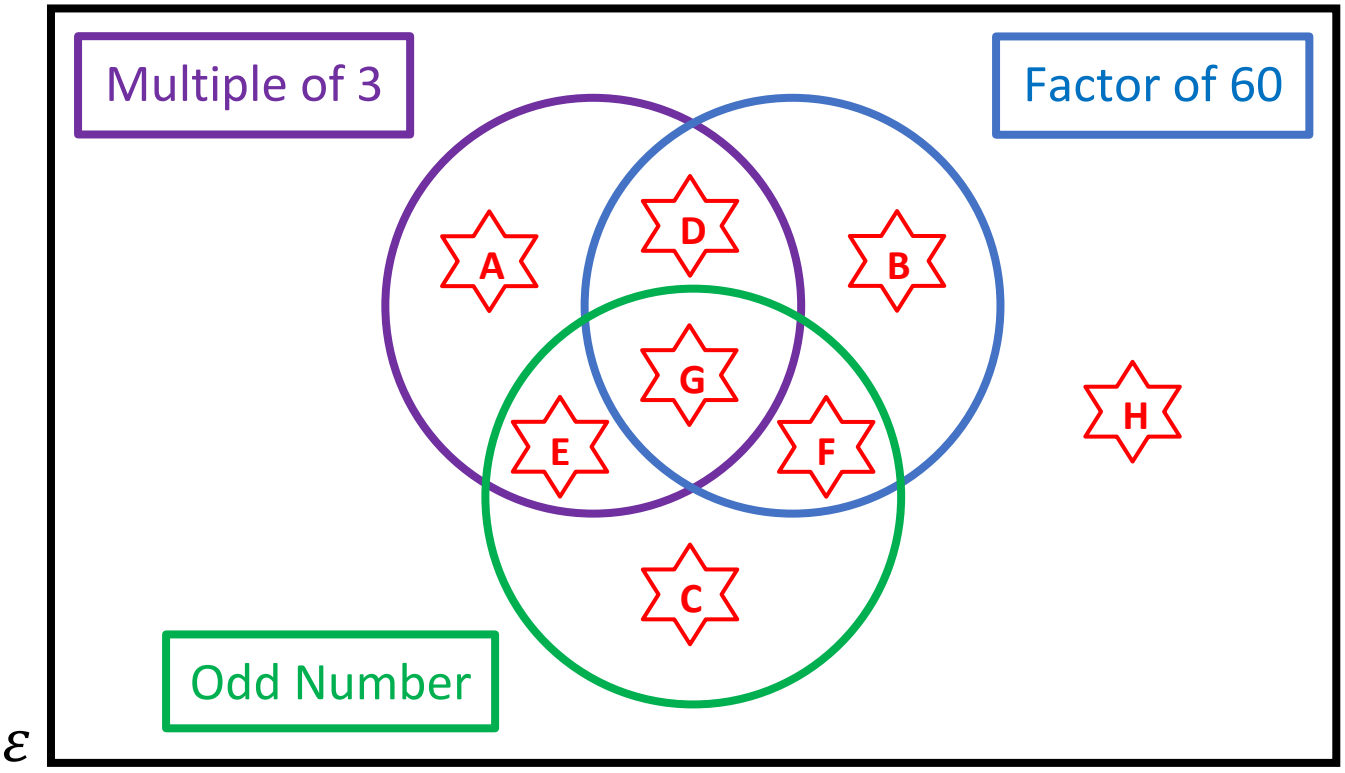
___ out of 6

Quiz 4

1) What is 20% of £30?	2) In which quadrant is the co-ordinate (–5, 2)?	3) Shade A'.  ε
4) Sketch a kite.	5) Share £48 between Ann and Bryn according to the ratio 3 : 5.	6) What is the nth term of the sequence 16, 13, 10, 7, 4, ...?
7) Evaluate $36^{\frac{1}{2}}$.	8) Make x the subject of the formula $y = 3x - 6$.	9) What is the lower bound of the measurement 25 cm, measured to the nearest cm?

___ out of 9

Venn Diagram Challenge 2



Think of a number that could fit into each region. If you think a region is impossible to fill, explain why!

A

B

C

D

E

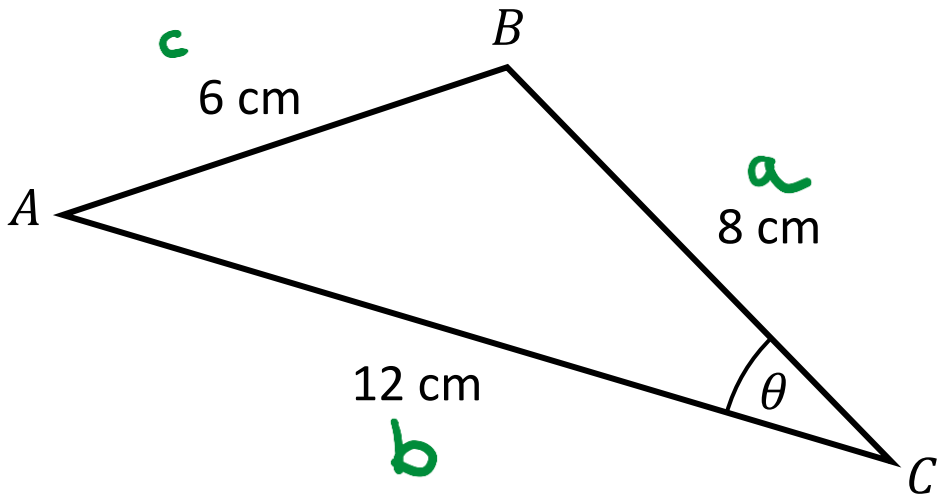
F

G

H

Example 4

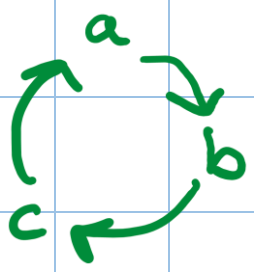
Calculate the size of the angle θ.



Cosine Rule for finding angles:

$$\cos A = \frac{b^2+c^2-a^2}{2bc}$$

$$\cos C = \frac{a^2+b^2-c^2}{2ab}$$



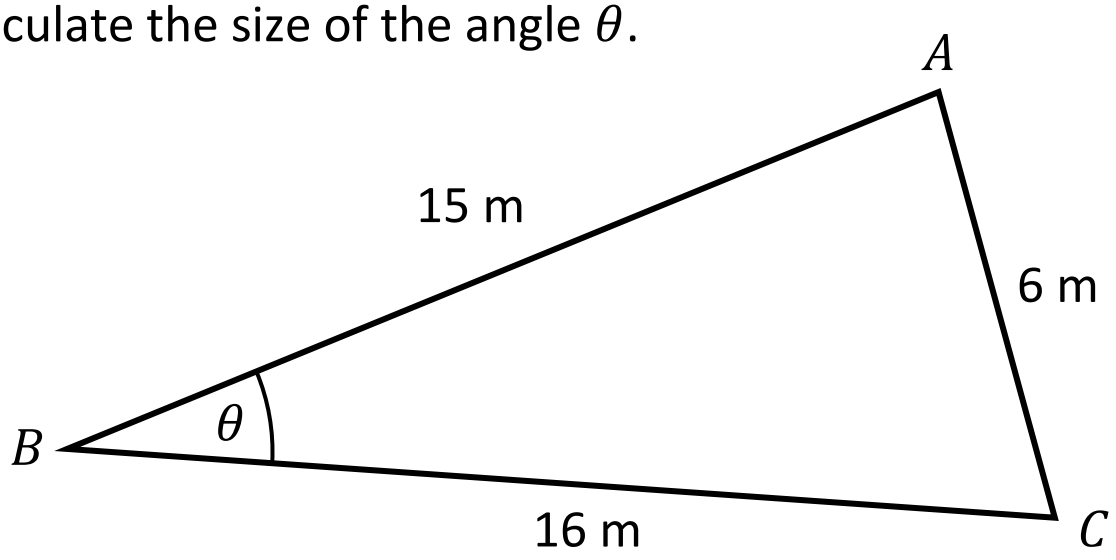
$$\cos\theta = \frac{8^2+12^2-6^2}{2\times 8\times 12}$$

$$\theta = \cos^{-1}\left(\frac{8^2+12^2-6^2}{2\times 8\times 12}\right)$$

$\theta = 26.38^\circ$ to 2 d.p.

Exercise 4

Calculate the size of the angle θ.



___ out of 3

Quiz 5

1) Solve the inequality $2x + 3 < 8$	2) Write two different formulae for calculating the area of a triangle.	3) Simplify $x^4 \times x^2$.
4) What are the next two numbers? 1, 4, 9, 16, ..., ...	5) Factorise $x^2 + 9x + 20$.	6) In a box and whisker diagram, the line in the middle of the box represents the...
7) Expand $(x - 4)(x + 8)$.	8) What is the circumference of a circle with radius 7.5 cm?	9) What is the reciprocal of $\frac{4}{5}$? Write your answer as a mixed number.

____ out of 9

Square Root of 40

1) Which number do you obtain on squaring $\sqrt{40}$?

2) Between which two whole numbers does $\sqrt{40}$ appear?

$$\sqrt{40}$$

3) Write $\sqrt{40}$ in the form $a\sqrt{b}$, where a and b are whole numbers.

4) $\sqrt{40}$ is the hypotenuse of a right-angled triangle. Find the two other lengths of the triangle, given they are whole number lengths.

___ out of 6

Evaluating the Workbook

Notes