

AQA

GCSE

Mathematics

SET B – Paper 2 Higher Tier

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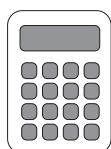
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Materials

Time allowed: 1 hour 30 minutes

For this paper you must have:

- calculator
- mathematical instruments



Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer **all** questions.
- You must answer the questions in the space provided.
- In all calculations, show clearly how you work out your answer.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may use additional paper, graph paper and tracing paper.

Name:

Answer **all** questions in the spaces provided.

- 1 Circle the fraction that is **not** a recurring decimal.

[1 mark]

$$\frac{1}{9}$$

$$\frac{1}{3}$$

$$\frac{2}{5}$$

$$\frac{9}{11}$$

- 2 The point $A(6, 7)$ is reflected to the point A' in the line $y = x$.

Circle the coordinates of A' .

[1 mark]

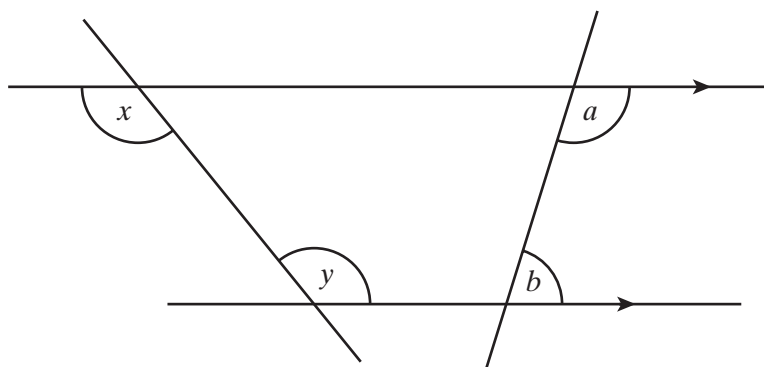
$$(6, -7)$$

$$(-6, 7)$$

$$(7, 6)$$

$$(-6, -7)$$

- 3 Here are four straight lines, two of which are parallel.



- 3 (a) Circle the words that describe the relationship between angle x and angle y .

[1 mark]

alternate angles

vertically opposite angles

corresponding angles

co-interior angles

- 3 (b) Circle the correct statement for the angles shown.

[1 mark]

$x = a$

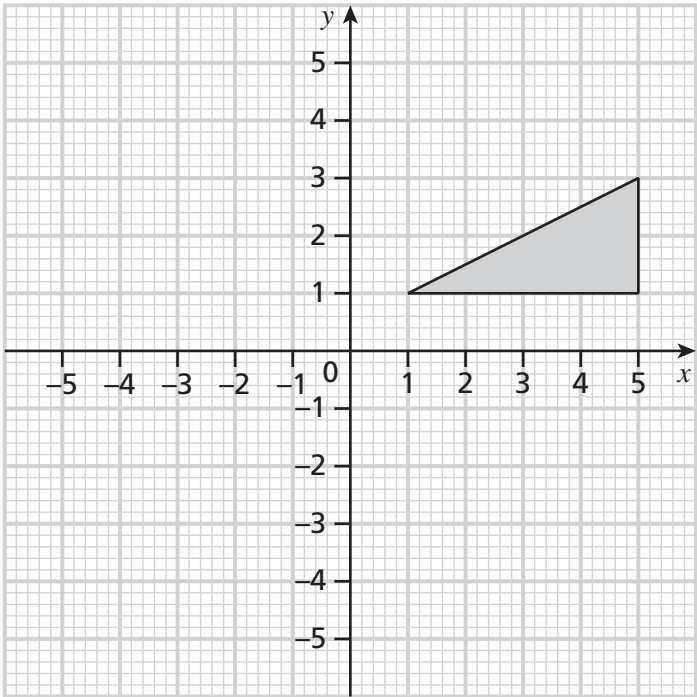
$x + b = 180$

$a + b = 180$

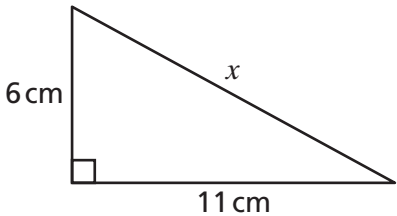
$a = b$

4 Translate the triangle by $\begin{pmatrix} -3 \\ -4 \end{pmatrix}$

[2 marks]



5 Work out the length x in the triangle.



Not drawn
accurately

[3 marks]

$x =$ cm

6 The table shows the heights of some young trees.

Height, h , cm	Frequency
$140 \leq h < 150$	5
$150 \leq h < 160$	9
$160 \leq h < 170$	12
$170 \leq h < 180$	8
$180 \leq h < 190$	6

Work out an estimate of the mean height.

[3 marks]

Answer cm

7 (a) As a product of prime factors $20 = 2^2 \times 5$

Work out 28 as a product of prime factors.

[2 marks]

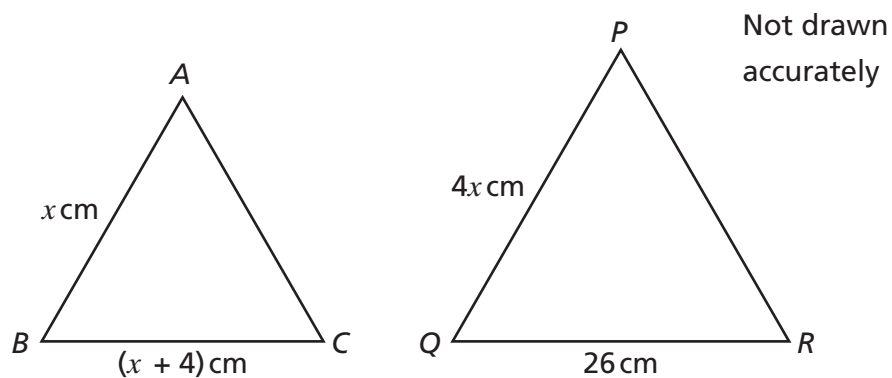
Answer

7 (b) Work out the least common multiple of 20 and 28.

[2 marks]

Answer

- 8 Triangles ABC and PQR are similar.



Work out the value of x .

[3 marks]

$x =$ cm

- 9 A washing machine is reduced by 15% in a sale.

The sale price of the washing machine is £238.

What was the original price of the washing machine?

[3 marks]

Answer £

- 10** Two numbers are in the ratio 2 : 5

The difference between the numbers is 36.

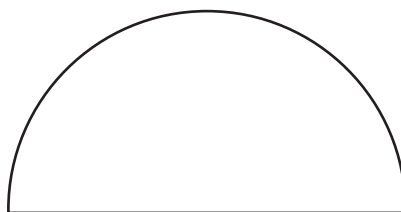
Work out the values of the two numbers.

[3 marks]

Answer and

- 11** The area of this semicircle is 201 cm^2 to 3 significant figures.

Not drawn
accurately



Work out the perimeter of the semicircle.

[3 marks]

Answer cm

- 12 Using ruler and compasses only, construct an angle of 30° at A.

You must show your construction arcs.

[3 marks]

A _____

- 13 (a) Expand $5(x - 2)(4x + 3)$

[2 marks]

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Answer

- 13 (b) Factorise fully $2x^2 + 8x + 6$

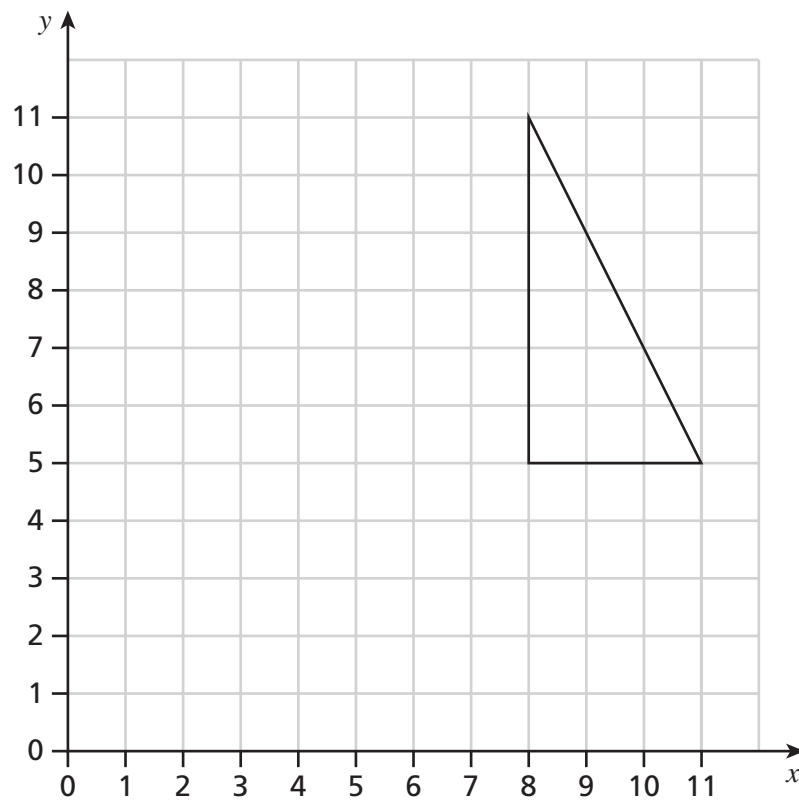
[2 marks]

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Answer

- 14 Enlarge the triangle by a scale factor of $-\frac{1}{3}$ about the centre (5, 8).

[3 marks]



- 15** A jar contains 30 red beads and 40 white beads.

The number of red beads is increased by 60%

The number of white beads is increased by $p\%$

The number of red and white beads is now equal.

Work out the value of p .

[3 marks]

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.....

.....

Answer

- 16 (a)** Write $x^2 + 6x - 9$ in the form $(x + a)^2 - b$, where a and b are integers.

[3 marks]

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Answer

- 16 (b)** Hence, or otherwise, solve $x^2 + 6x - 9 = 0$

Give answers in the form $p \pm \sqrt{q}$, where p and q are integers.

[2 marks]

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.....

Answer

17 Write the equation $\frac{2}{x+1} - \frac{3}{4x-1} = 1$

in the form $ax^2 + bx + c = 0$ where a , b and c are integers.

[4 marks]

Answer

18 y is directly proportional to the square of x .

When $y = 20$, $x = 2$

18 (a) Work out the value of y when $x = 10$

[3 marks]

Answer

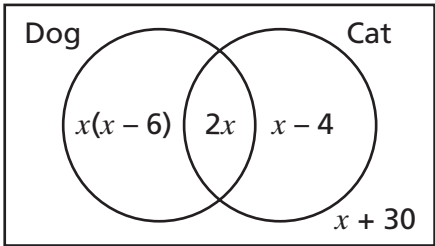
18 (b) Work out the value of x when $y = 5$

[2 marks]

Answer

19 146 students in year 7 were asked if they had a cat, a dog or both.

The Venn diagram shows the results.



A student is picked at random.

Work out the probability that the student only has a cat.

[5 marks]

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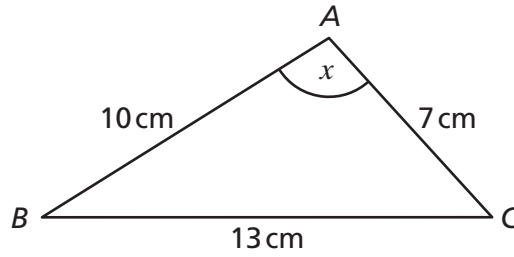
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Answer

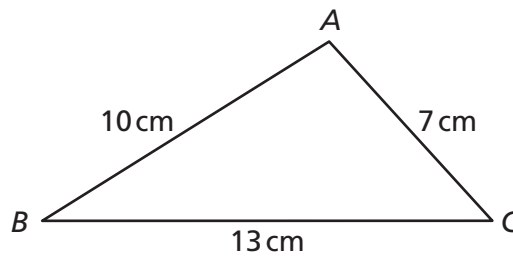
- 20 (a) Work out angle x in this triangle.



[3 marks]

$x =$ $^{\circ}$

- 20 (b) Work out the area of this triangle.



[2 marks]

Answer cm^2

- 21 Show that $\frac{6}{3-\sqrt{3}}$ can be simplified to $(3+\sqrt{3})$

You **must** show **all** the steps of your working.

[3 marks]

- 22 The formula connecting the sine of angle x , the opposite side (o) and the hypotenuse (h), is $\sin x = \frac{o}{h}$

$h = 12$ to 2 significant figures

$o = 8.3$ to 2 significant figures

Work out the upper and lower bounds for the angle x .

Give your angles to 1 decimal place.

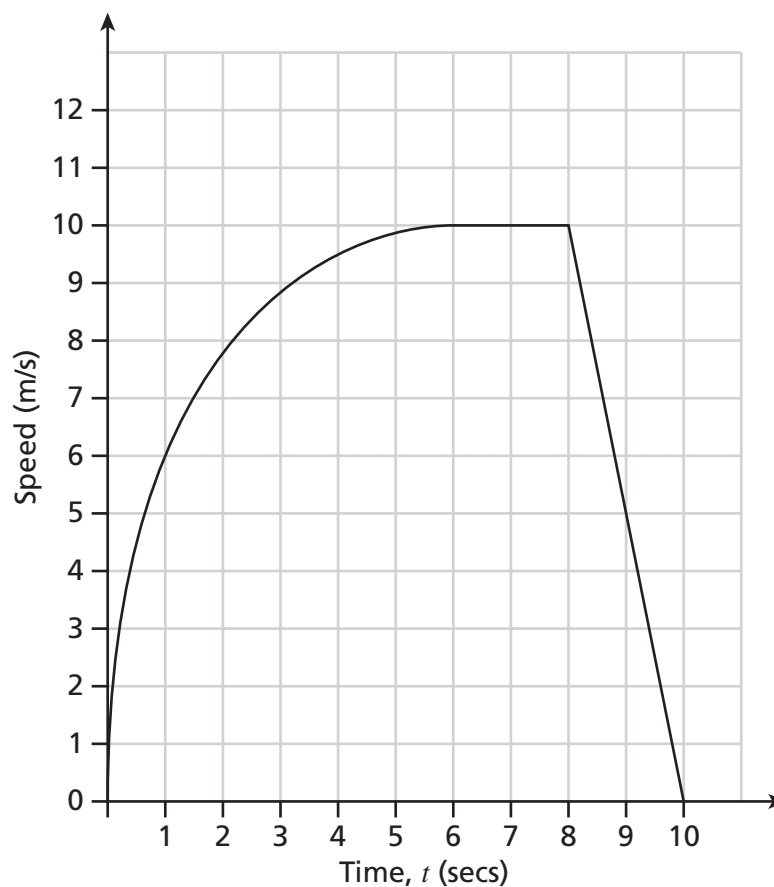
You **must** show your working.

[5 marks]

Upper limit _____

Lower limit _____

- 23** The speed–time graph for a journey is shown.



- 23 (a)** Estimate the acceleration at 3 seconds.

[3 marks]

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Answer m/s^2

23 (b) Estimate the average speed for the journey.

[4 marks]

Answer m/s

END OF QUESTIONS