Collins

Edexcel

GCSE

Mathematics

H

SET B – Paper 2 Higher Tier (Calculator)

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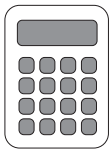
Time allowed: 1 hour 30 minutes

You must have:

- Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator.



Instructions

- Use **black** ink or black ball-point pen.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- **Calculators may be used.**
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

Information

- The total mark for this paper is 80.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Name: .....

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages of your working.

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

Work out the coordinates of A'.

.....

(Total for Question 1 is 2 marks)

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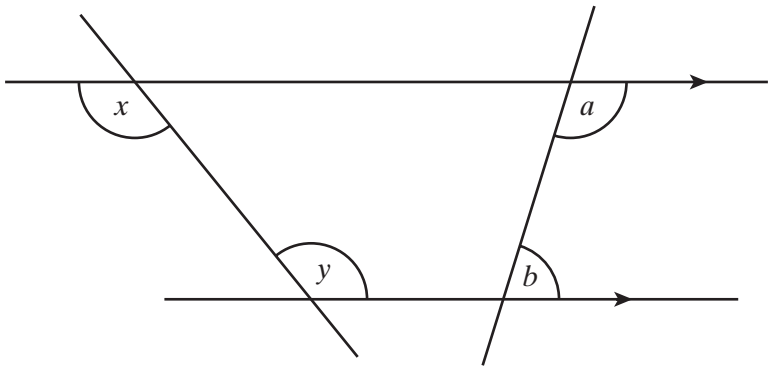
2 Here are four straight lines, two of which are parallel.



(a) Complete the sentence with the correct word that describes the relationship between angle x and angle y.

Angle x and angle y are ..... angles. **(1)**

(b) Write down an equation that describes the relationship between angle a and angle b.

.....

(1)

(Total for Question 2 is 2 marks)

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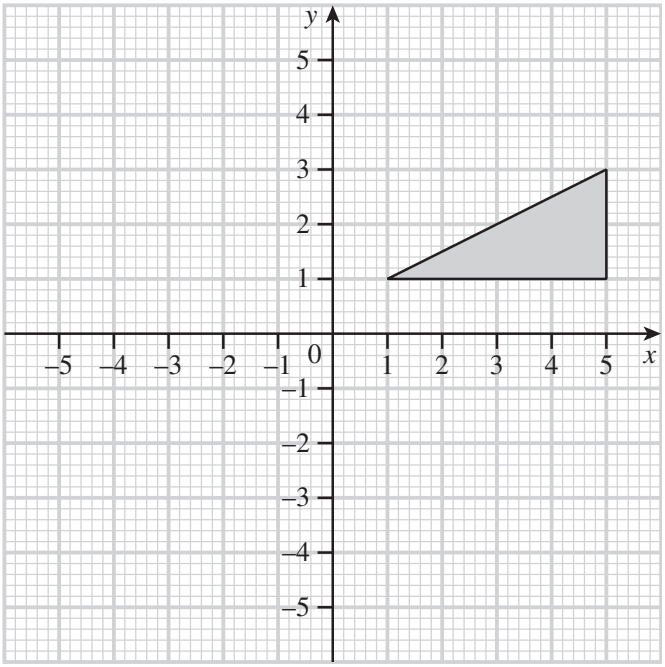
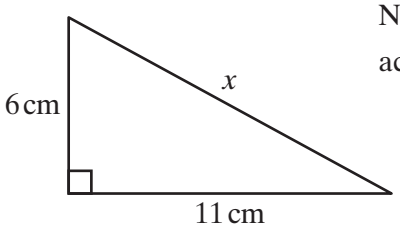
3 Translate the triangle by $\begin{pmatrix} -3 \\ -4 \end{pmatrix}$



(Total for Question 3 is 2 marks)

4 Work out the length x in the triangle.



Not drawn accurately

$x =$ ..... cm

(Total for Question 4 is 3 marks)

5 The table shows the heights of some young trees.

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

Work out an estimate of the mean height.

.....

(Total for Question 5 is 3 marks)

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

Work out 28 as a product of prime factors.

.....

(2)

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

.....

(2)

(Total for Question 6 is 4 marks)

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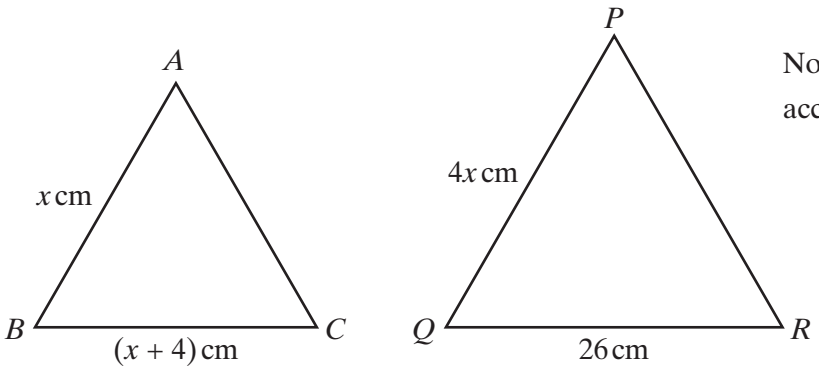
7 Triangles ABC and PQR are similar.



Not drawn accurately

Work out the value of x.

$x =$ .....

(Total for Question 7 is 3 marks)

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8 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?

(Total for Question 8 is 3 marks)

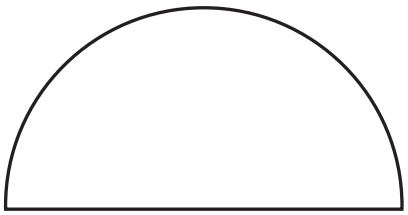
9 Two numbers are in the ratio 2 : 5

The difference between the numbers is 36.

Work out the values of the two numbers.

(Total for Question 9 is 3 marks)

10 The area of this semicircle is 201 cm^2 to 3 significant figures.



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Work out the perimeter of the semicircle.

(Total for Question 10 is 3 marks)

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

You must show your construction arcs.

A _____

(Total for Question 11 is 3 marks)

12 **(a)** Expand $5(x - 2)(4x + 3)$.

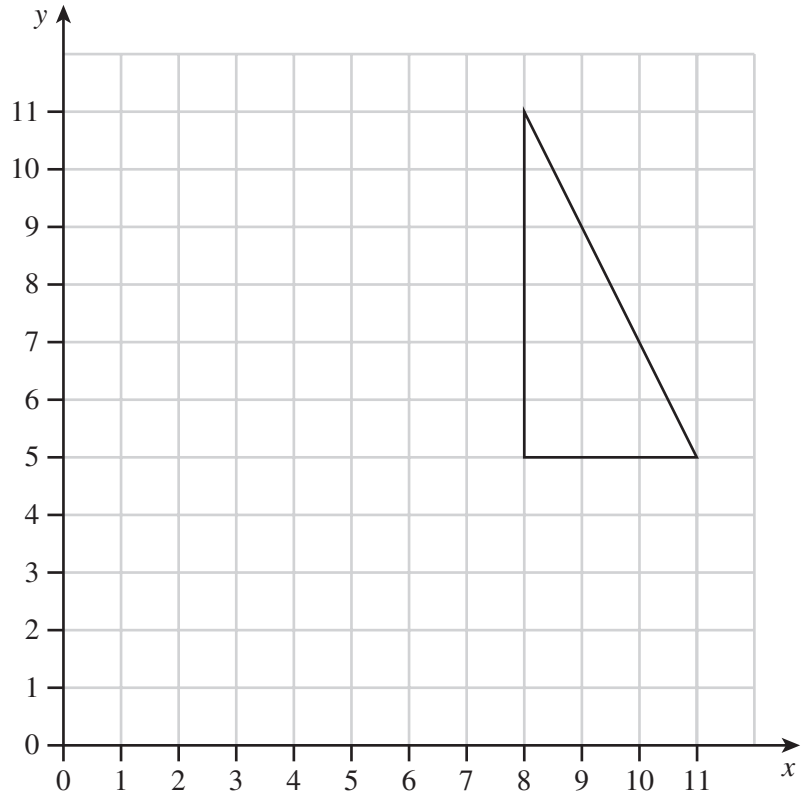
(2)

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

(2)

(Total for Question 12 is 4 marks)

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



(Total for Question 13 is 3 marks)

14 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.

(Total for Question 14 is 3 marks)

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

(3)

(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)

(Total for Question 15 is 5 marks)

16 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.

(Total for Question 16 is 4 marks)

17 y is directly proportional to the square of x.

When $y = 20, x = 2$

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

(3)

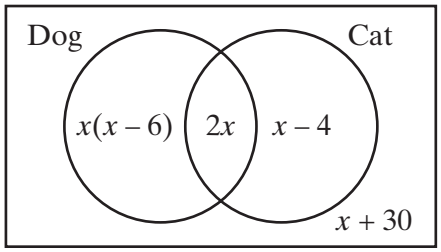
(b) Work out the value of x when $y = 5$

(2)

(Total for Question 17 is 5 marks)

18 146 students in year 7 were asked if they had a cat, a dog or both.

The Venn diagram shows the results.

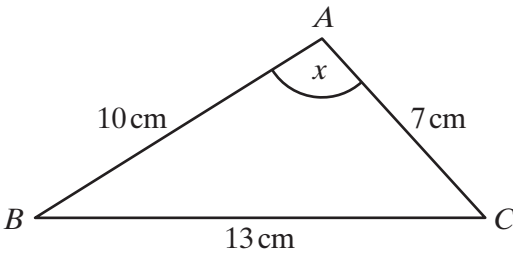


A student is picked at random.

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

(Total for Question 18 is 5 marks)

19 **(a)** Work out angle x in this triangle.



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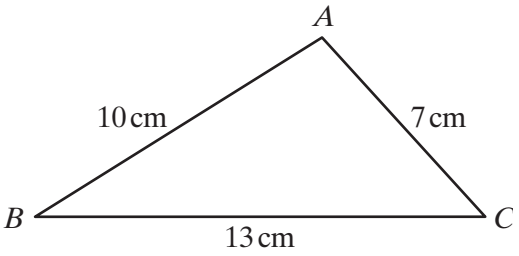
$x =$ ..... °

(3)

(b) Work out the area of this triangle.



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..... cm^2

(2)

(Total for Question 19 is 5 marks)

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

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

(Total for Question 20 is 3 marks)

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21 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.

Upper bound .....

Lower bound .....

(Total for Question 21 is 5 marks)

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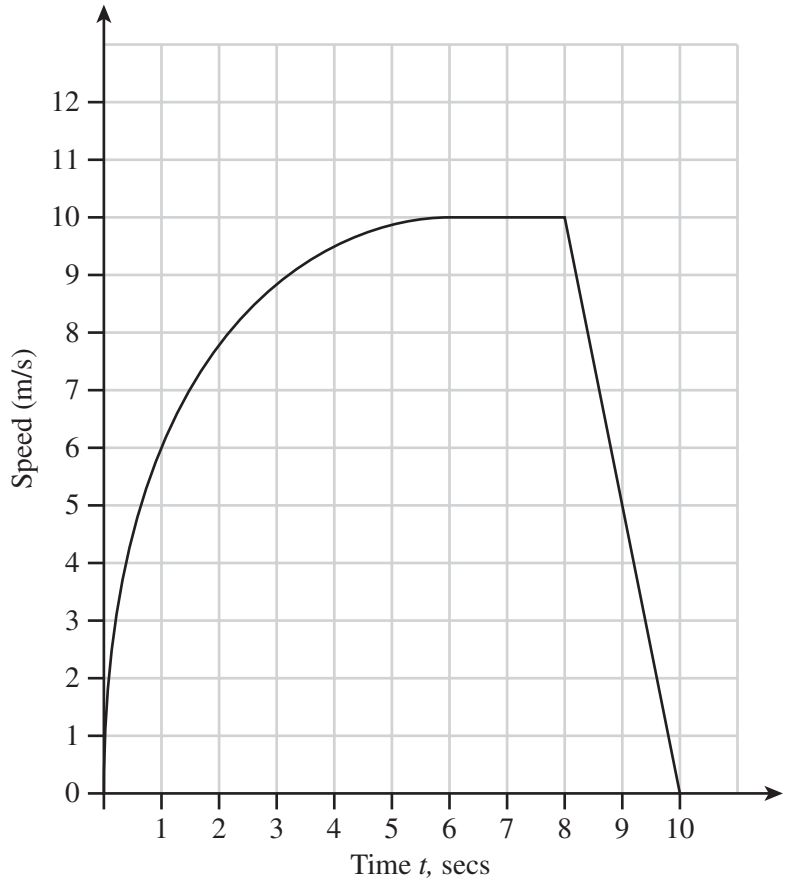
22 The speed–time graph for a journey is shown.



(a) Estimate the acceleration at 3 seconds.

.....

(3)

(b) Estimate the average speed for the journey.

.....

(4)

(Total for Question 22 is 7 marks)

TOTAL FOR PAPER IS 80 MARKS

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