Oxford Cambridge and RSA

# GCSE (9-1) Mathematics

**J560/05** Paper 5 (Higher Tier)

## Question Set 3

**1.** **(a)** Work out.

$$\frac{3}{4}+\frac{1}{6}$$

Give your answer in its simplest form.

**(a)** ..... **[2]**

**(b)** By writing each number correct to 1 significant figure, use estimation to show that

$$\frac{39.6\times 20.2}{\sqrt{99.2}}\approx 80.$$ **[3]**

**2.** Given that $168 = 2^3\times 3\times 7$, find the lowest common multiple (LCM) of 168 and 30.

..... **[3]**

**3.** Martina has answered some questions on algebra.
In each question, she has made an error.

Describe her error and give the correct answer to each problem.

**(a) Question 1** Simplify. $2a \times a \times a$

Martina's answer $4a$

Martina's error is .....

.....

Correct answer = ..... **[2]**

**(b) Question 2** Simplify. $\frac{x^{10}}{x^2}$

Martina's answer $x^5$

Martina's error is .....

.....

Correct answer = ..... **[2]**

**(c) Question 3** $s = ut + \frac{1}{2}at^2$

Find $s$ when $u = 0$, $t = 5$ and $a = 6$.

Martina's solution $s = 0 \times 5 + \frac{1}{2} \times 6 \times 5^2$

$s = 0 + 15^2$

$s = 225$

Martina's error is .....

.....

Correct answer = ..... **[2]**

**4.** Sundip and Emma have some money.
The ratio of Sundip's money to Emma's money is 3 : 5.
Emma spends £450 of her money.
The ratio of Sundip's money to Emma's money is now 2 : 3.

Find how much money Sundip has.

£ ..... **[4]**

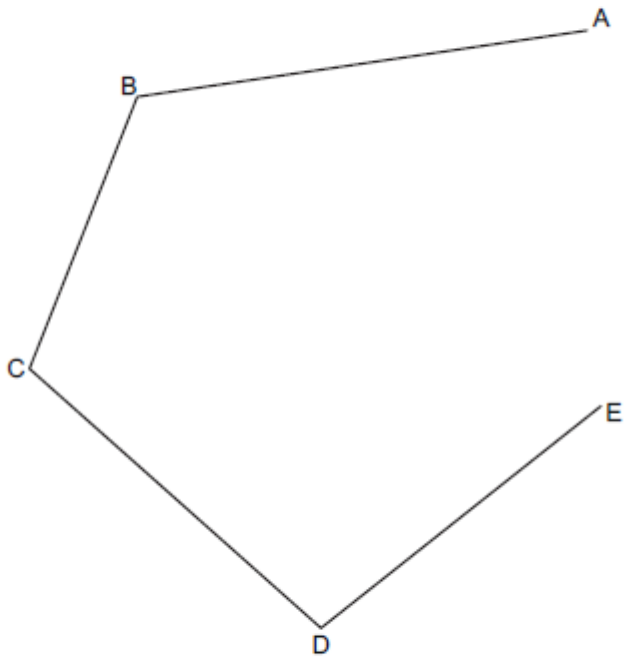
**5.** **(a)** The scale 1 cm represents 25 m can be written in the form 1 : $k$.

Find the value of $k$.

**(a)** $k =$ ..... **[1]**

**(b)** The scale drawing represents a harbour.

**Scale: 1cm represents 25 m**



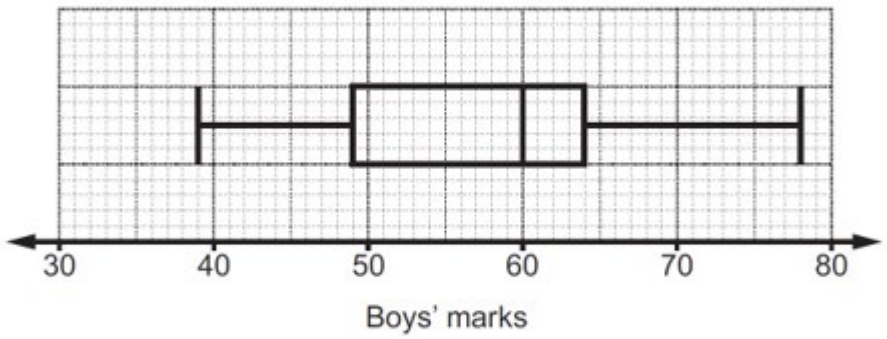

A boat leaves the harbour from point C and sails on a path that is equidistant from BC and CD.
The harbour rules do not allow boats to sail within 75 m of point E.

Find by construction whether the path of the boat will follow the harbour rules.
Show all your construction lines.

..... **[5]**

**6.**

The box plot shows the distribution of the marks scored by some boys in a test.



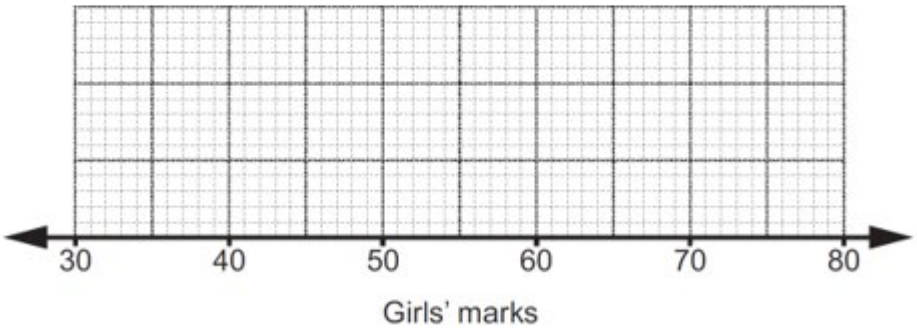

**(a)** Find the interquartile range.

**(a)** ..... **[2]**

**(b)** The marks for some girls in the same test are summarised below.

- median = 58
- lowest mark = 32
- range = 44
- upper quartile = 66
- interquartile range = 12

Draw a box plot to show the distribution of the marks scored by the girls.




**[3]**

**(c)** Eleanor says

The boys did better, on average, in the test as they had a bigger interquartile range.

Is her statement correct?
Explain your reasoning.

.....

..... **[2]**

**7.** $y$ is inversely proportional to the square root of $x$.
$y = 7$ when $x = 25$.

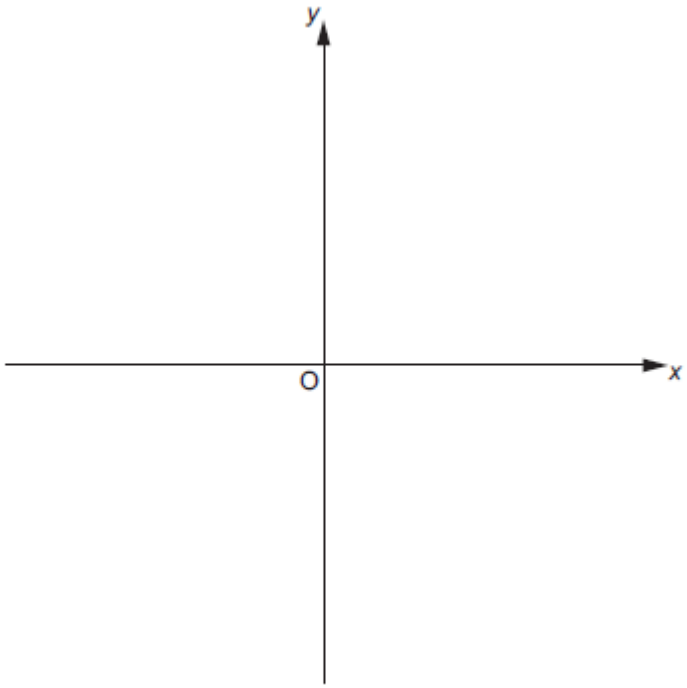
Find the value of $y$ when $x = 100$.

$y =$ ..... **[3]**

**8.** **(a)** Write $x^2 - 6x + 11$ in the form $(x - a)^2 + b$.

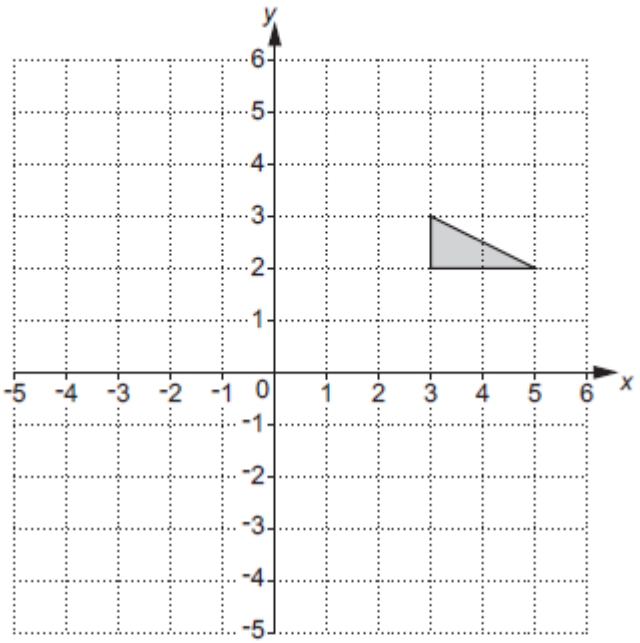
**(a)** ..... **[3]**

**(b)** Sketch the graph of $y = x^2 - 6x + 11$.
Show clearly the coordinates of any turning points.




**[3]**

**9.** You may use this coordinate grid to help you answer the following questions.




Describe fully the **single** transformation that is equivalent to

**(a)** a translation of $\begin{pmatrix} -7 \\ 2 \end{pmatrix}$ followed by a translation of $\begin{pmatrix} 3 \\ -5 \end{pmatrix}$.

.....

..... **[2]**

**(b)** a reflection in the line $y = x$ followed by a rotation of 90° clockwise around (0, 0).

.....

..... **[3]**

**10.** In this question all units are in cm.

A circle has equation $x^2 + y^2 = 36$.

**(a)** Write down the radius and centre of the circle.

**(a)** radius: ..... cm

centre: (....., .....) **[2]**

**(b)** The distinct points A ($a$, $\sqrt{11}$) and B ($b$, $\sqrt{11}$) lie on the circumference of the circle.

Work out the length AB.

**(b)** ..... cm **[4]**

# Total Marks for Question Set 3: 51