

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

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

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]

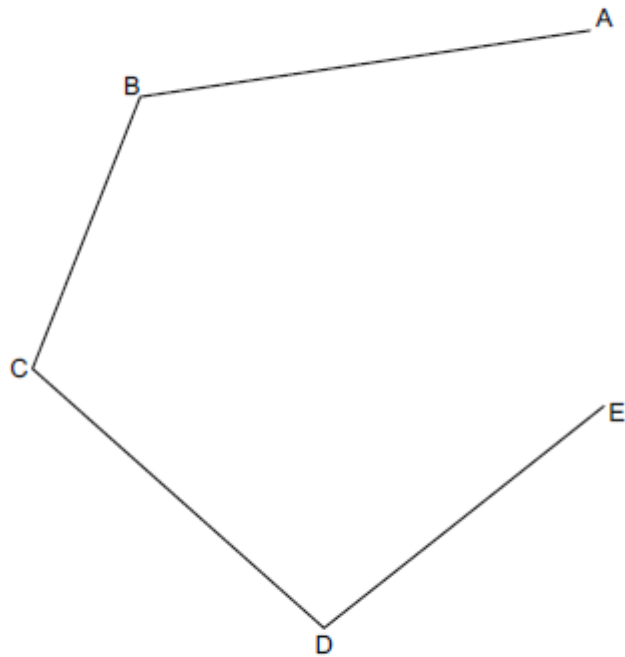
5. (a) The scale 1 cm represents 25m can be written in the form 1 : k .

Find the value of k .

(a) $k = \dots\dots\dots$ [1]

- (b) The scale drawing represents a harbour.

Scale: 1cm represents 25 m



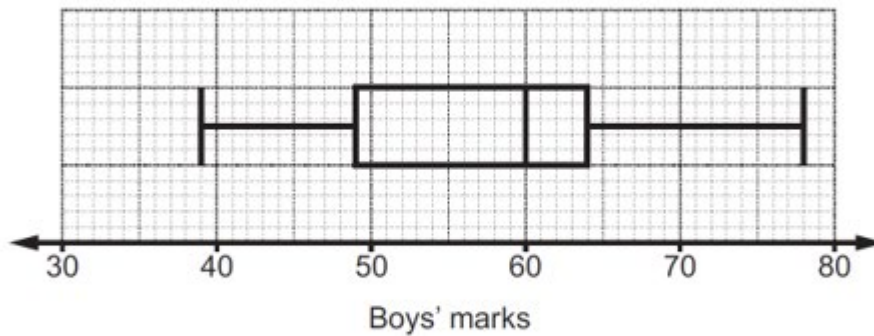
A boat leaves the harbour from point C and sails on a path that is equidistant from BC and CD. The harbour rules do not allow boats to sail within 75 m of point E.

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

$\dots\dots\dots$ [5]

6.

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



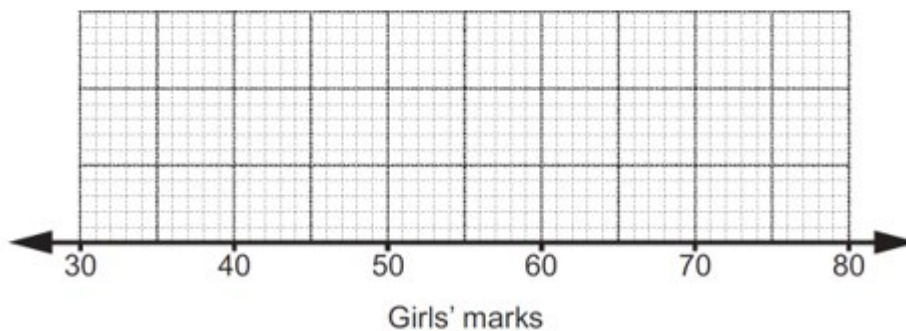
(a) Find the interquartile range.

(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 $x = 25$.

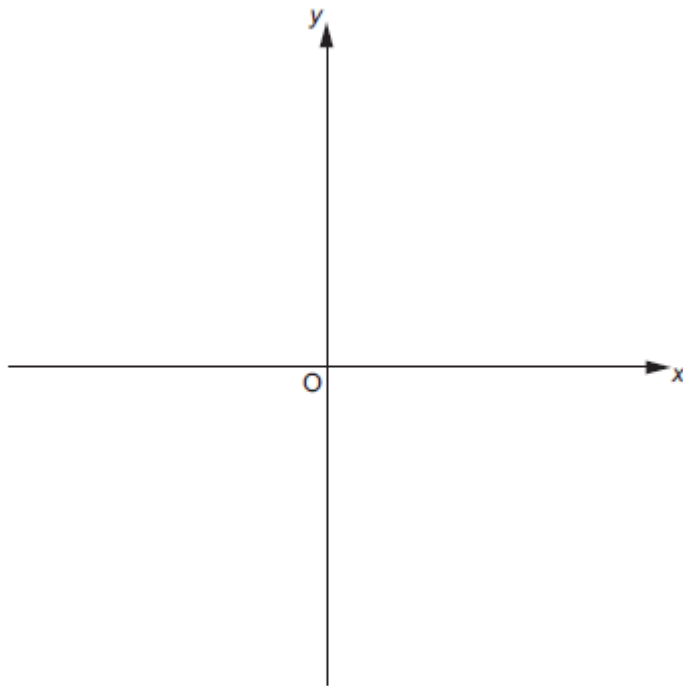
Find the value of y when $x = 100$.

$y = \dots\dots\dots$ [3]

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

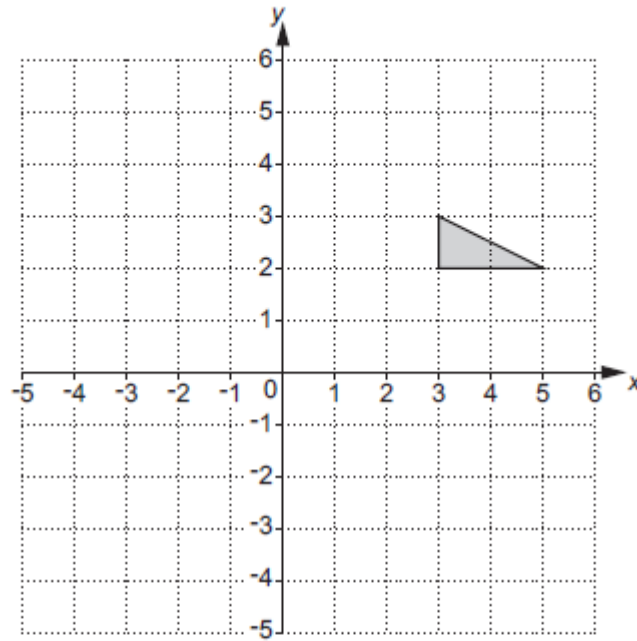
(a) [3]

(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

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