

**GCSE (9-1) Mathematics**  
**J560/05** Paper 5 (Higher Tier)

**Question Set 2**

1. Work out  $(2 \times 10^3) \times (4 \times 10^4)$ , giving your answer in standard form.

..... [2]

2. Ed has a card shop.

(a) He buys a particular card for £1.20 and sells it for £1.68.

Calculate his percentage profit on this card.

(a) ..... % [3]

(b) Ed's profit on "Good Luck" cards in 2018 was £360.  
This was a decrease of 20% on his profit in 2017.

Work out Ed's profit on "Good Luck" cards in 2017.

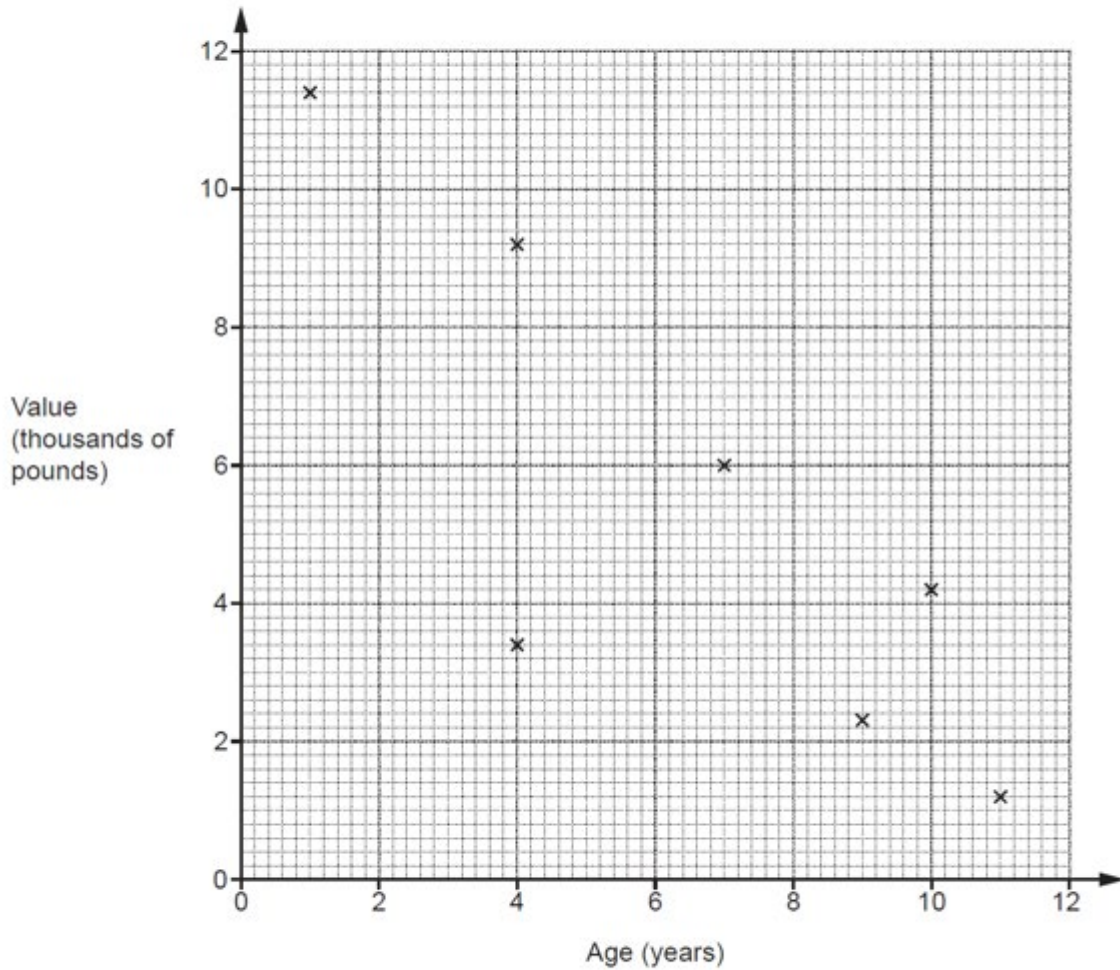
(b) £ ..... [3]

3.

The table shows the ages and values of 11 cars of the same model.

Age (years)	4	7	11	1	9	10	4	3	7	8	12
Value (thousands of pounds)	9.2	6.0	1.2	11.4	2.3	4.2	3.4	8.0	5.6	5.0	0.4

The points for the first 7 cars are plotted on the scatter diagram.



(a) Plot the points for the remaining 4 cars. [2]

(b) Describe the type and strength of the correlation shown in the completed scatter diagram.

..... [2]

(c) One car lost its value more quickly than the other cars.

On the scatter diagram, draw a circle around the point representing this car. [1]

(d) By drawing a line of best fit, estimate the value of a car that is 6 years old.

(d) £ ..... [2]

(e) Explain the limitations of using the equation of the line of best fit to estimate the value of a car that is 16 years old.

.....  
..... [1]

4.

Adam buys some theatre tickets in a sale.

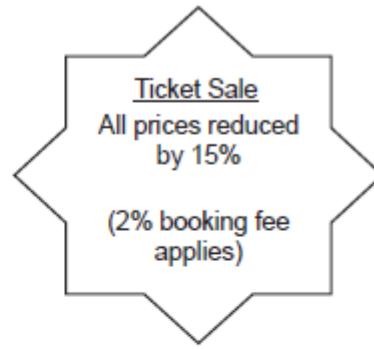
The normal prices are:

£80 for each adult  
£40 for each child.

In the sale, the prices are reduced by 15%.

Adam buys 2 adult tickets and 1 child ticket at the sale price.  
A 2% booking fee is then added to the total cost of the tickets.

Calculate the total amount that Adam must pay.



£ ..... [6]

5. (a) Simplify fully.

$$\sqrt{200}$$

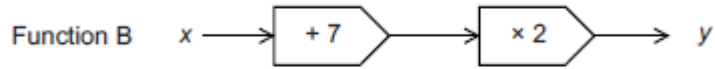
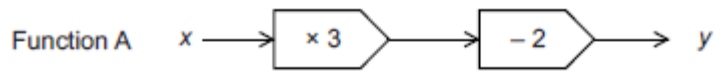
(a) ..... [2]

(b) Evaluate.

$$8^{\frac{1}{3}}$$

(b) ..... [1]

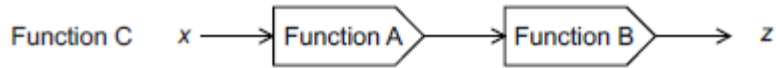
6. Here are two functions.



(a) Find an algebraic expression for the output of the **inverse** of function A when the input is  $x$ .

(a) ..... [2]

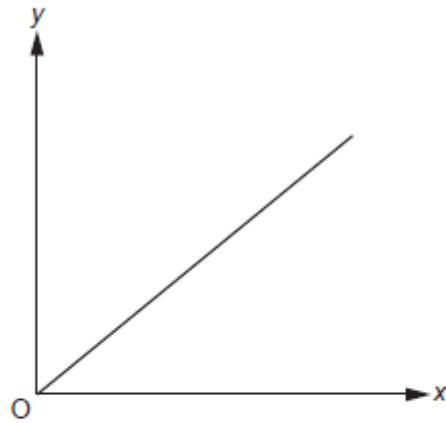
(b) Here is a composite function C.



Find the value  $x$  when  $z = 4x$ .

(b)  $x =$  ..... [5]

7. Shirley is asked to sketch a graph of  $y = 5^x$  for  $x \geq 0$ . She produces the following.

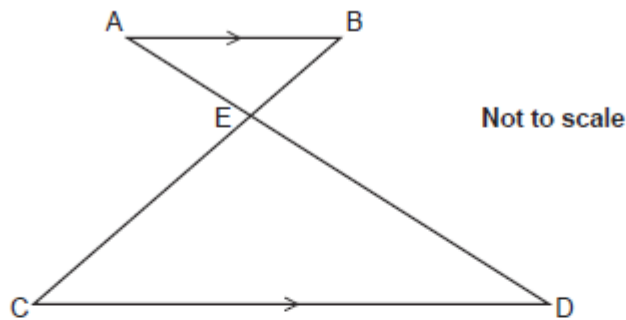


The graph has two errors.

How should they be corrected?

- 1 .....
- .....
- 2 .....
- ..... [2]

8. In the diagram AB is parallel to CD. AED and BEC are straight lines.

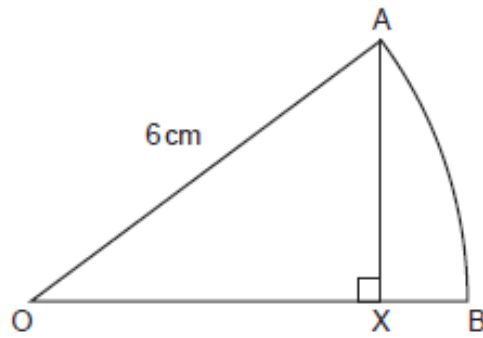


Prove that triangle ABE is similar to triangle CDE.

- .....
- .....
- .....
- ..... [3]



9. OAB is a sector of a circle, centre O.  
OA = 6 cm and AX is perpendicular to OB.



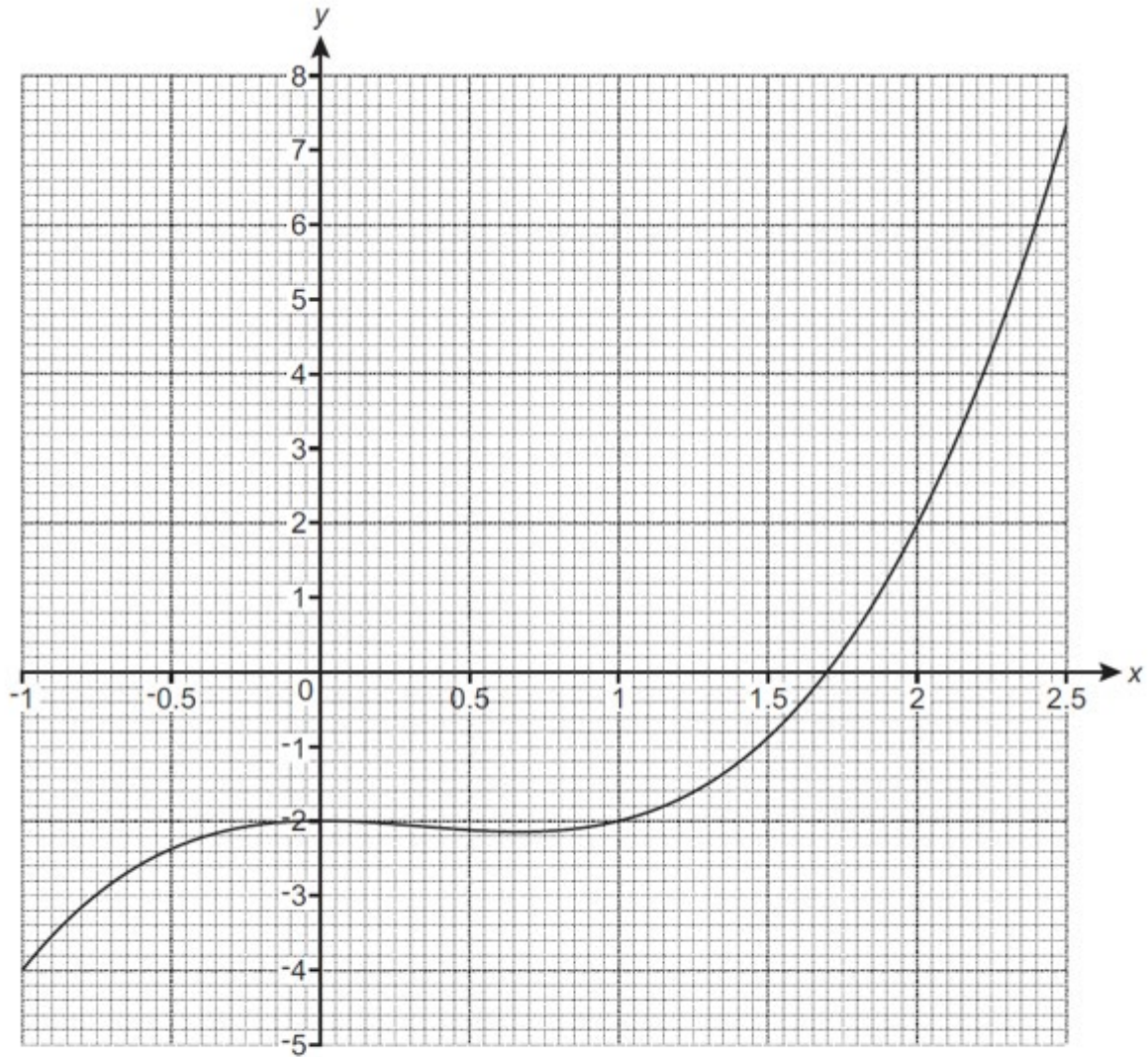
Not to scale

The area of sector OAB is  $6\pi \text{ cm}^2$ .

Show that  $AX = 3\sqrt{3} \text{ cm}$ .

[6]

The graph of  $y = x^3 - x^2 - 2$  is drawn on the grid.



- (a) Use the graph to solve  $x^3 - x^2 - 2 = 0$ .  
Give your answer correct to 1 decimal place.

$x = \dots\dots\dots$  [1]

(b) The equation  $x^3 - x^2 + 5x - 6 = 0$  can be solved by finding the intersection of the graph of  $y = x^3 - x^2 - 2$  and the line  $y = ax + b$ .

(i) Find the value of  $a$  and the value of  $b$ .

(b)(i)  $a = \dots\dots\dots$

$b = \dots\dots\dots$  [2]

(ii) Hence, **use the graph** to solve the equation  $x^3 - x^2 + 5x - 6 = 0$ .  
Give your answer correct to 1 decimal place.

(ii)  $x = \dots\dots\dots$  [3]

**Total Marks for Question Set 2: 49**

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