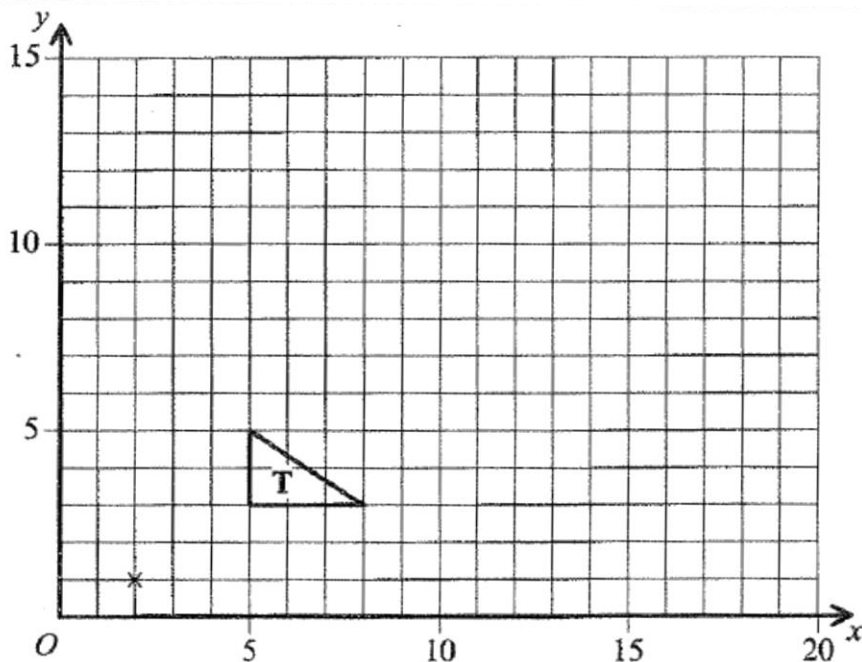


Mixed Exercise 3

1.



On the grid, enlarge triangle **T** with a scale factor of 3 and centre (2, 1).

**(Total 3 marks)**

2.

(a) Factorise  $9p + 15$

.....  
(1)

(b) Factorise  $q^2 - 4q$

.....  
(1)

(c) Factorise  $x^2 - 3x - 10$

.....  
(2)

3.

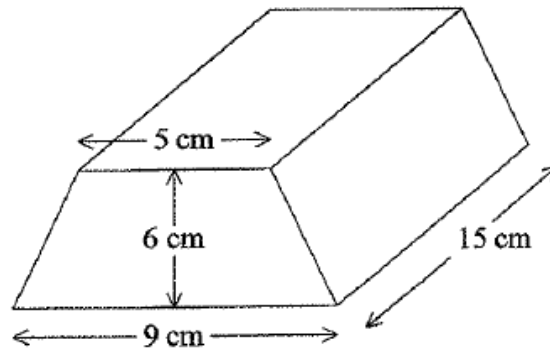


Diagram NOT  
accurately drawn

The diagram shows a prism.

The cross section of the prism is a trapezium.

The lengths of the parallel sides of the trapezium are 9 cm and 5 cm.

The distance between the parallel sides of the trapezium is 6 cm.

The length of the prism is 15 cm.

(a) Work out the area of the trapezium.

..... cm<sup>2</sup>  
(2)

(b) Work out the volume of the prism.

..... cm<sup>3</sup>  
(2)

4.

In a sale at *Bargain Buys*, all the normal prices are reduced by 15%.

The normal price of a printer is £240

(a) Work out the sale price of the printer.

£.....  
(3)

In the same sale, the sale price of a laptop computer is £663

(b) Work out the normal price of the laptop computer.

£.....  
(3)

---

5.

(a) Solve the inequality  $2x - 3 < 5$

.....  
(2)

(b)  $n$  is a positive integer.

Write down all the values of  $n$  which satisfy the inequality  $2n - 3 < 5$

.....  
(2)

---

6.

The table gives information about the ages, in years, of the 80 members of a sports club.

Age ( $t$ years)	Frequency
$10 < t \leq 20$	8
$20 < t \leq 30$	38
$30 < t \leq 40$	28
$40 < t \leq 50$	4
$50 < t \leq 60$	2

Work out an estimate for the mean age of the 80 members.

..... years  
(4)

---

7.

Make  $W$  the subject of the formula  $h = \sqrt{\frac{W}{I}}$

$W =$  .....  
(Total 2 marks)

---

8.

The size of each exterior angle of a regular polygon is  $18^\circ$ .

(a) Work out how many sides the polygon has.

.....  
(2)

(b) Work out the **sum** of the interior angles of the polygon.

.....  
(2)

9.

The height of a hall is 12 m.

A scale model is made of the hall.

The height of the scale model of the hall is 30 cm.

(a) Express the scale of the model in the form  $1:n$

.....  
(3)

The length of the scale model of the hall is 95 cm.

(b) Work out the real length of the hall.

Give your answer in metres.

..... m  
(3)

---

10.

Solve  $\frac{x-1}{2} + \frac{2x+3}{4} = 1$

$x =$  .....

**(Total 4 marks)**

11.

(a) Express  $\frac{10}{\sqrt{5}}$  in the form  $k\sqrt{5}$  where  $k$  is an integer.

.....  
(2)

(b) Express  $(5 + \sqrt{3})^2$  in the form  $a + b\sqrt{3}$  where  $a$  and  $b$  are integers.

.....  
(2)

---

12.

Simplify fully  $\frac{2}{x-1} + \frac{x-11}{x^2+3x-4}$

.....  
(Total 6 marks)

13.

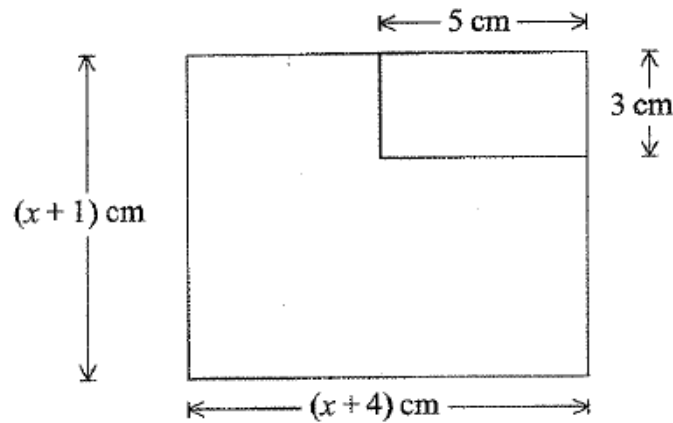


Diagram NOT  
accurately drawn

A rectangular piece of card has length  $(x + 4)$  cm and width  $(x + 1)$  cm.  
A rectangle 5 cm by 3 cm is cut from the corner of the piece of card.  
The remaining piece of card, shown shaded in the diagram, has an area of  $35 \text{ cm}^2$ .

(a) Show that  $x^2 + 5x - 46 = 0$

(3)

(b) Solve  $x^2 + 5x - 46 = 0$  to find the value of  $x$ .  
Give your answer correct to 3 significant figures.

$x = \dots\dots\dots$   
(3)

14.

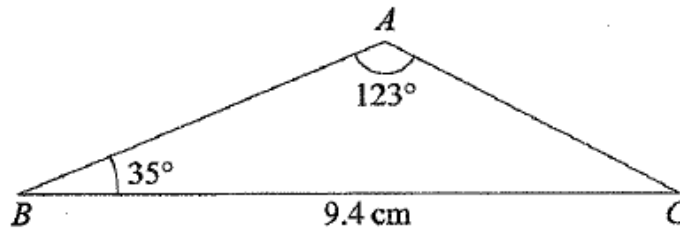


Diagram NOT accurately drawn

$BC = 9.4$  cm.  
Angle  $BAC = 123^\circ$ .  
Angle  $ABC = 35^\circ$ .

- (a) Calculate the length of  $AC$ .  
Give your answer correct to 3 significant figures.

..... cm  
(3)

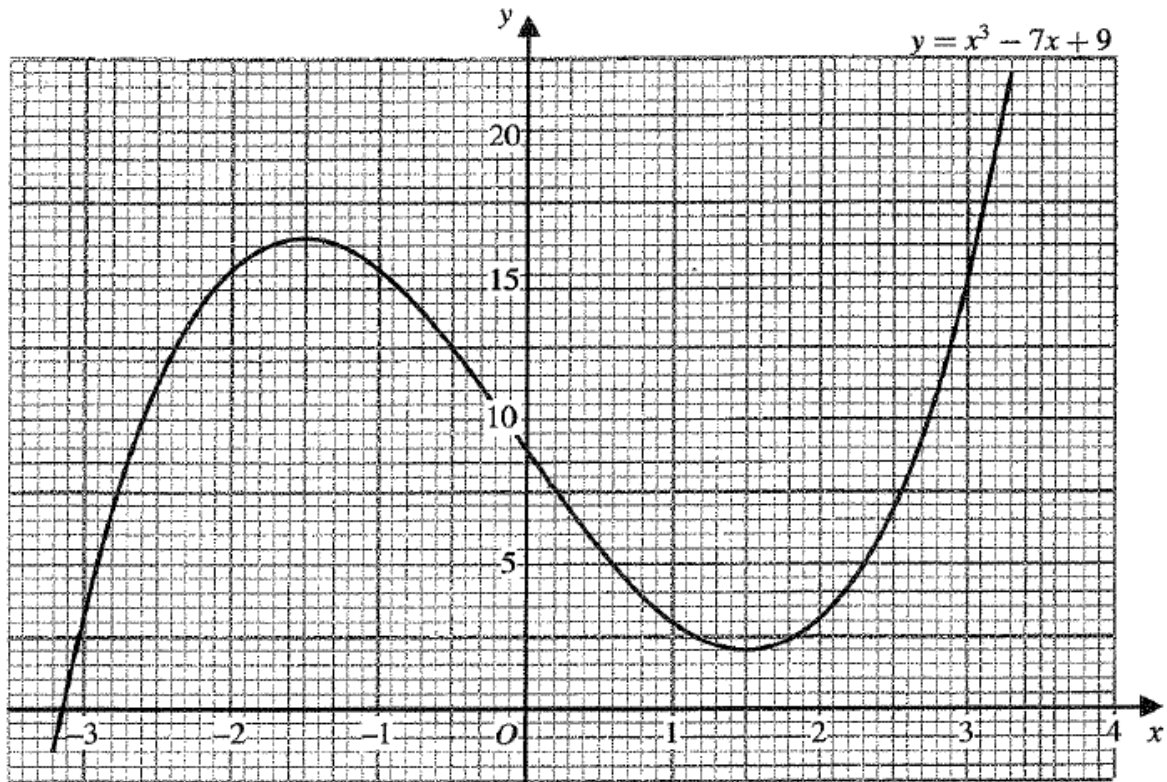
- (b) Calculate the area of triangle  $ABC$ .  
Give your answer correct to 3 significant figures.

.....  $\text{cm}^2$   
(3)



15.

Part of the graph of  $y = x^3 - 7x + 9$  is shown on the grid.



The graph of  $y = x^3 - 7x + 9$  and the line with equation  $y = k$ , where  $k$  is an integer, have 3 points of intersection.

(a) Find the greatest possible value of the integer  $k$ .

$k = \dots\dots\dots$   
(1)

(b) By drawing a suitable straight line on the grid, find estimates of the solutions of the equation  $x^3 - 6x - 2 = 0$ .  
Give your answers correct to 1 decimal place.

$\dots\dots\dots$   
(3)

16.

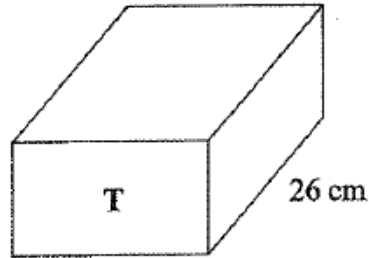
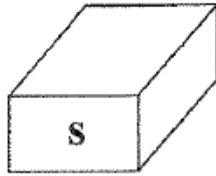


Diagram **NOT**  
accurately drawn

Two cuboids, **S** and **T**, are mathematically similar.  
The total surface area of cuboid **S** is  $157 \text{ cm}^2$  and the total surface area of cuboid **T** is  $2512 \text{ cm}^2$ .

- (a) The length of cuboid **T** is 26 cm.  
Calculate the length of cuboid **S**.

..... cm  
(3)

- (b) The volume of cuboid **S** is  $130 \text{ cm}^3$ .  
Calculate the volume of cuboid **T**.

.....  $\text{cm}^3$   
(2)