

Name:

## Question 1

4. (a) Given that  $y = \sqrt{2x - a}$ ,  
find the value of  $y$  when  $x = 4$  and  $a = -1$ .

## Question 2

- 3.** (a)  Simplify:

### Question 3

- (a)** Factorise fully  $9a^2 - 6ab + 12ac - 8bc$ .

- (b) Factorise  $9x^2 - 16y^2$ .

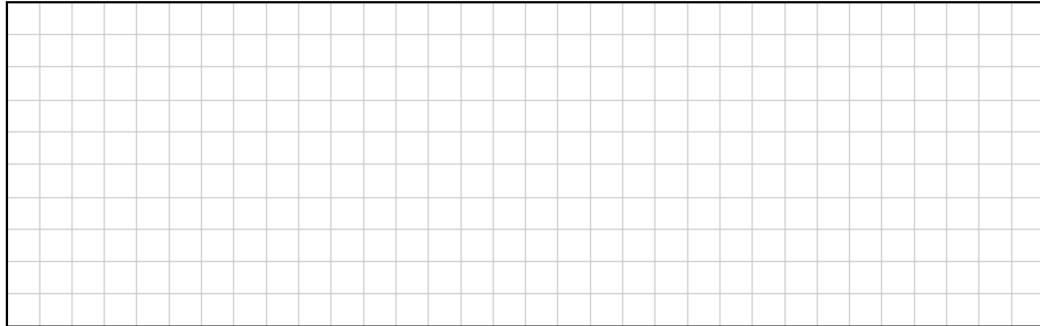
- (c) Use factors to simplify the following:  $\frac{2x^2 + 4x}{2x^2 + x - 6}$ .

## Question 4

### Question 11

(Suggested maximum time: 5 minutes)

- (a) Simplify  $5x^2 - 7x + 3x^2 - 6x$ .



## Question 5

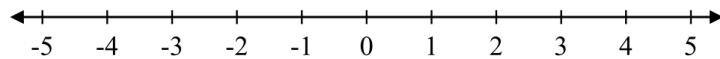
4. (a)  Graph on the number line the solution set of

$$4 - x \geq 2x - 5, x \in \mathbb{N}.$$

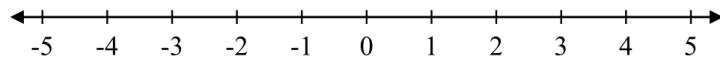
## Question 6

- (b) Graph each of the following inequalities on the number line given.

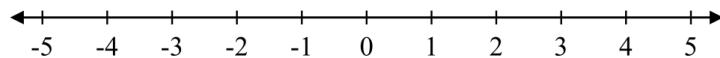
- (i)  $x < 4$ , where  $x \in \mathbb{N}$ .



- (ii)  $x < 4$ , where  $x \in \mathbb{Z}$ .



- (iii)  $x < 4$ , where  $x \in \mathbb{R}$ .



### Question 7

(d) Solve the equation  $2x^2 - 7x - 3 = 0$ .

Give each answer correct to 2 decimal places.

A large rectangular grid of graph paper, consisting of approximately 20 columns and 25 rows of small squares, intended for students to show their working for the question.

## Question 8

(c) (i) Solve the simultaneous equations:

$$2x - 3y = 18$$

$$5x + 9y = -10.$$

A large rectangular grid of small squares, intended for students to show their working for part (i) of the question.

(ii) Verify your answer to (c)(i).

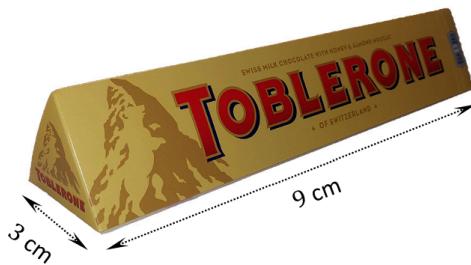
A second large rectangular grid of small squares, intended for students to show their working for part (ii) of the question.

## Question 9

### Question 6

(Suggested maximum time: 5 minutes)

A chocolate bar in the shape of a prism is shown below.

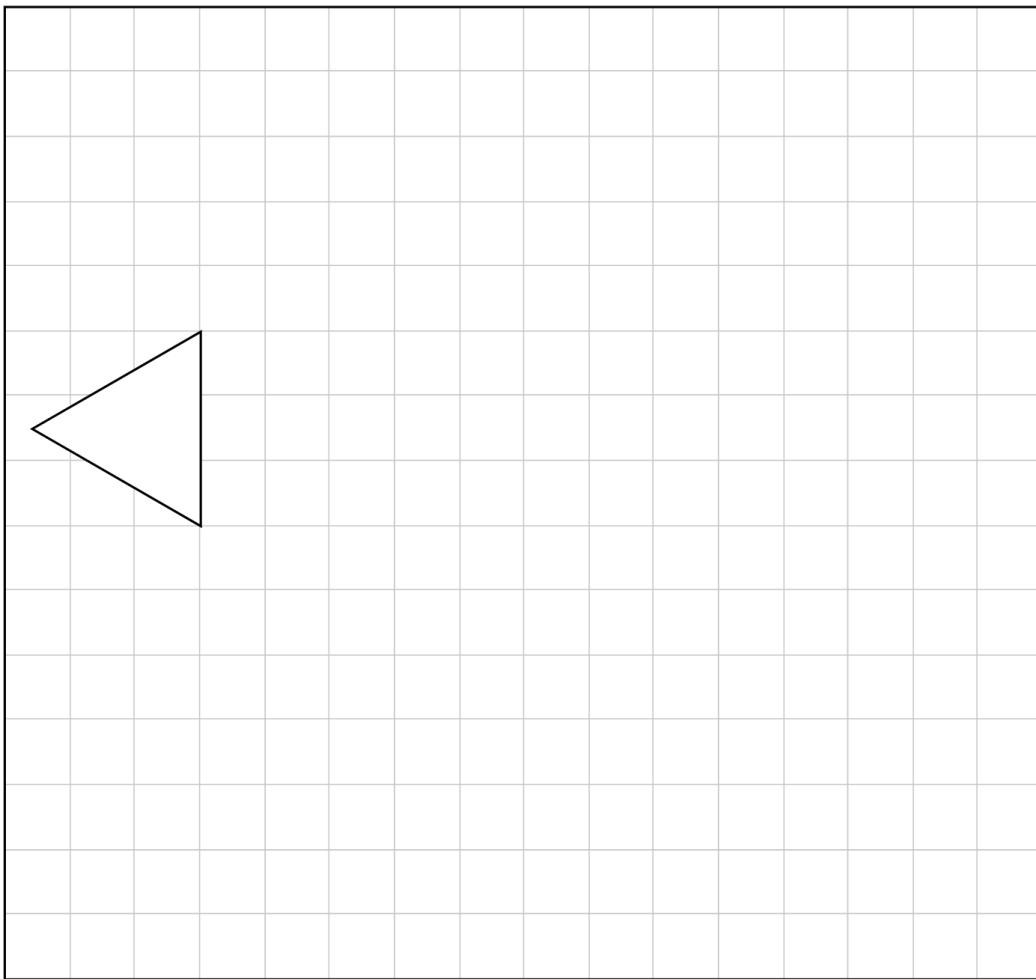


The front and back faces are each in the shape of equilateral triangles, with sides of length 3 cm. The other three faces are each in the shape of rectangles that are 9 cm in length, as shown above.

Complete an accurate net of the prism below, by drawing in the four missing faces.

One of the triangular faces has already been drawn.

Each small square in the grid has sides of length 1 cm.



## Question 10

### Question 13

(Suggested maximum time: 10 minutes)

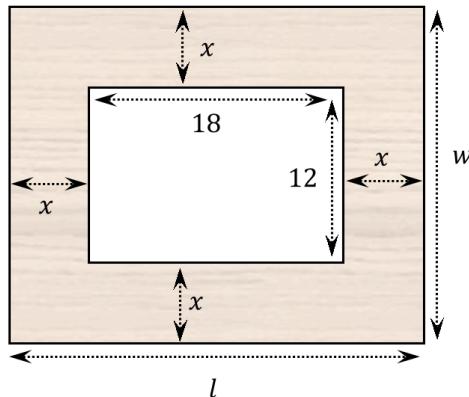
In this question, all lengths are in cm.

The diagram below shows a rectangular frame for a photo, where  $w, l, x \in \mathbb{R}$ .

The width of the frame is  $w$  and the length is  $l$ .

There is a rectangular hole in the middle for the photo, measuring 12 by 18.

The internal width of the frame is  $x$ , as shown.



- (a) The length of the frame  $l = 18 + 2x$ .

Write the **width** of the frame,  $w$ , in terms of  $x$ .

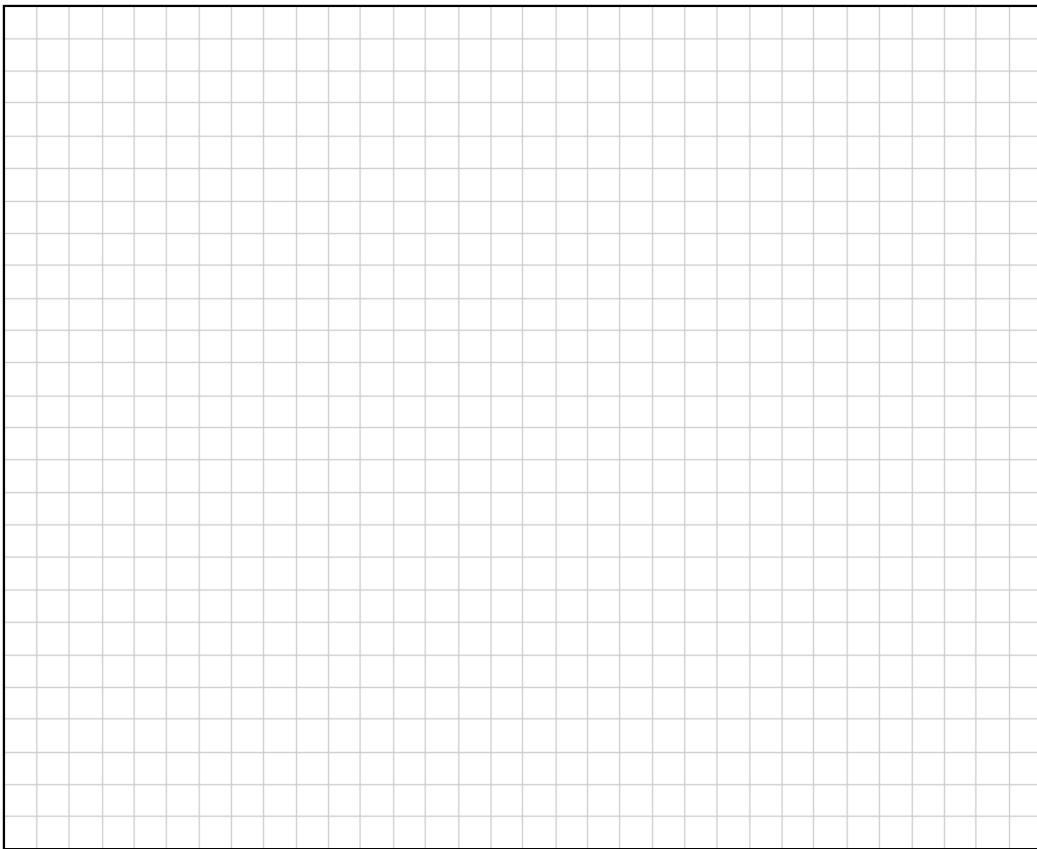
- (b) Hence, show that:

$$l \times w = 4x^2 + 60x + 216$$

(c)  $l \times w = 648 \text{ cm}^2$ .

Use this, and the information from part (b), to find the value of  $x$ .

Give your answer in cm, correct to 1 decimal place.



A large rectangular grid consisting of 12 columns and 18 rows of small squares, intended for working out the solution to the problem.