

1 Write down the temperature that is 7°C below -3°C .

..... $^{\circ}\text{C}$ [1]

2 Calculate $\sqrt{256^{0.25} + 4 \times 8}$.

..... [1]

3 Here is a list of numbers.

87 77 57 47 27

From this list, write down

(a) a cube number,

..... [1]

(b) a prime number.

..... [1]

4 Find the highest common factor (HCF) of 84 and 105.

..... [2]

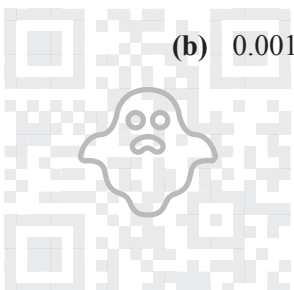
5 Write in standard form.

(a) 72000

..... [1]

(b) 0.0018

..... [1]



6 Expand and simplify $(x + 3)(x + 5)$.

..... [2]

7 Find the gradient of the line that is perpendicular to the line $2y = 3 + 5x$.

..... [2]

8 When $\sin x^\circ = 0.36$, find

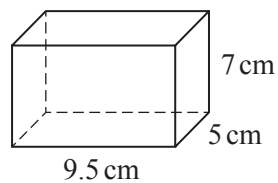
(a) the acute angle x° ,

..... [1]

(b) the obtuse angle x° .

..... [1]

9 A cuboid measures 5 cm by 7 cm by 9.5 cm.



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Work out the surface area of this cuboid.

..... cm² [3]



10 $5n$ is the mean of the three numbers 391, n and $n - 1$.

Find the value of n .

$n = \dots\dots\dots$ [3]

11 Factorise.

(a) $12x + 15$

$\dots\dots\dots$ [1]

(b) $xy - 2x + 3y - 6$

$\dots\dots\dots$ [2]

12 A is the point (2, 1) and B is the point (9, 4).

Find the length of AB .

$\dots\dots\dots$ [3]



- 13 A straight line joins the points $(3k, 6)$ and $(k, -5)$.
The line has a gradient of 2.

Find the value of k .

$k = \dots\dots\dots$ [3]

- 14 Find the n th term of each sequence.

(a) $\frac{1}{2}, \frac{1}{4}, \frac{1}{6}, \frac{1}{8}, \frac{1}{10}, \dots$

$\dots\dots\dots$ [1]

(b) 1, 5, 25, 125, 625, ...

$\dots\dots\dots$ [2]

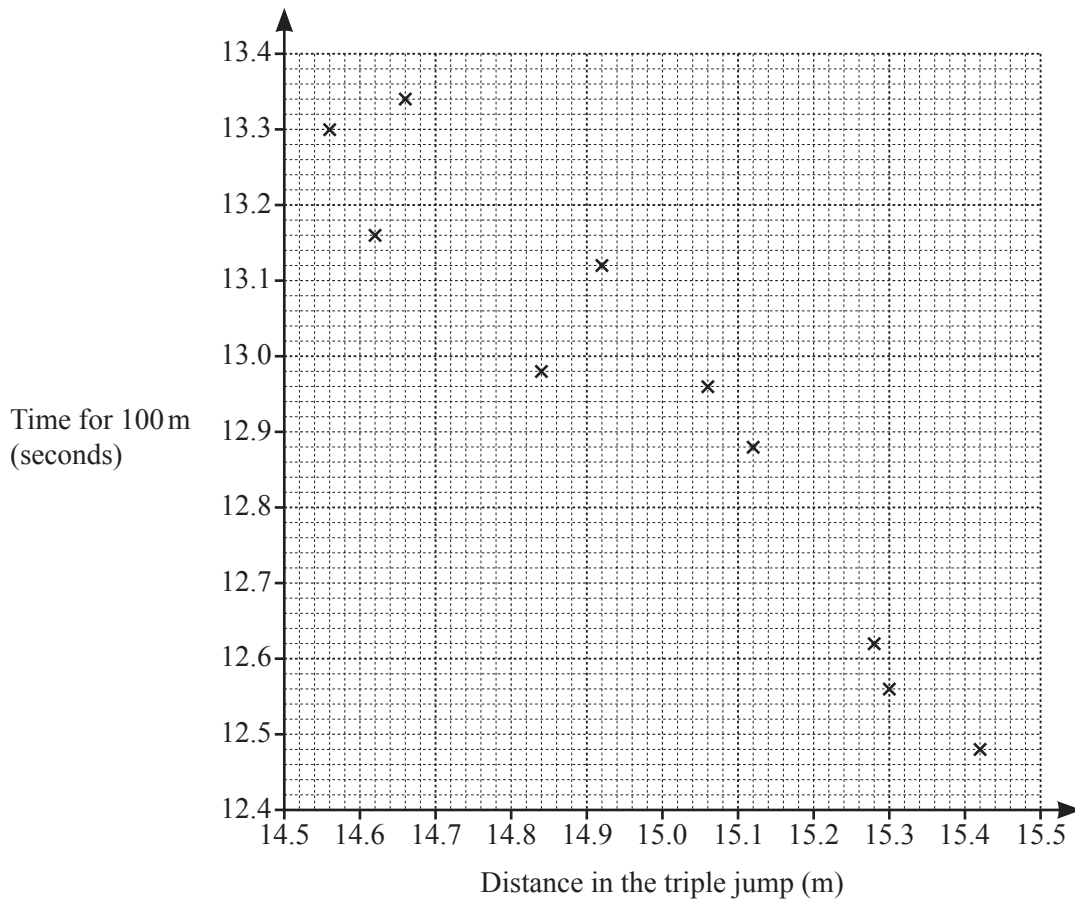
- 15 **Without using a calculator**, work out $\frac{2}{3} + \frac{1}{4} \times \frac{2}{3}$.

Write down all the steps of your working and give your answer as a fraction in its simplest form.

$\dots\dots\dots$ [4]



- 16 Ten athletes compete in both the 100 metre race and the triple jump. Their results are shown in the scatter diagram.



- (a) One of these athletes jumps 15.12 m in the triple jump.

Write down his time for the 100 metre race.

..... s [1]

- (b) The values for two other athletes are shown in the table.

Distance in the triple jump (m)	14.74	15.2
Time for 100 m (seconds)	13.2	12.76

On the scatter diagram, plot these points.

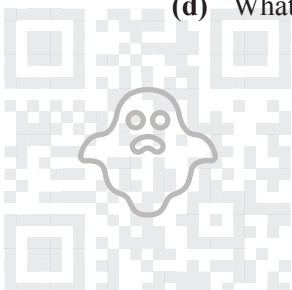
[1]

- (c) On the scatter diagram, draw a line of best fit.

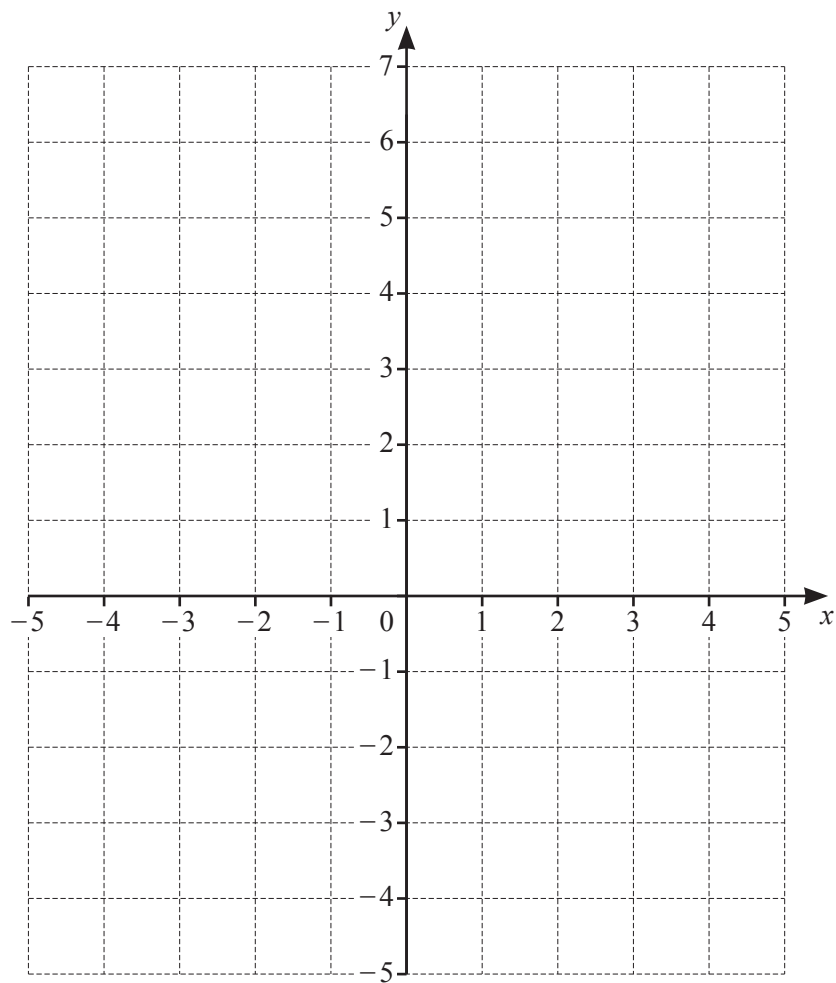
[1]

- (d) What type of correlation is shown in the scatter diagram?

..... [1]



17



By shading the **unwanted** regions on the grid, draw and label the region R that satisfies the following inequalities.

$$-2 < x \leq 3$$

$$y \leq x + 3$$

[4]



18 (a) $M = \{x : x \text{ is an integer and } 2 \leq x < 6\}$

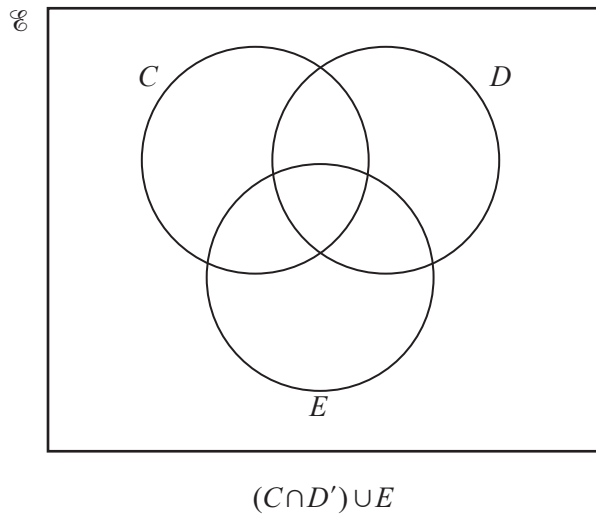
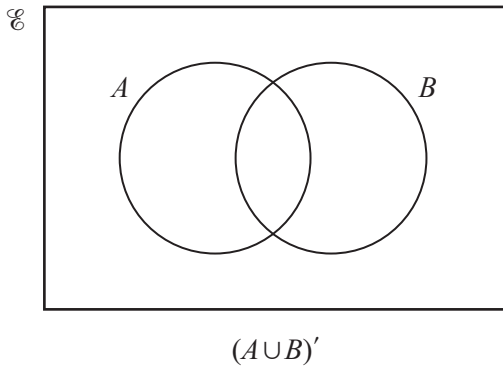
(i) Find $n(M)$.

..... [1]

(ii) Write down a set N where $N \subset M$ and $N \neq \emptyset$.

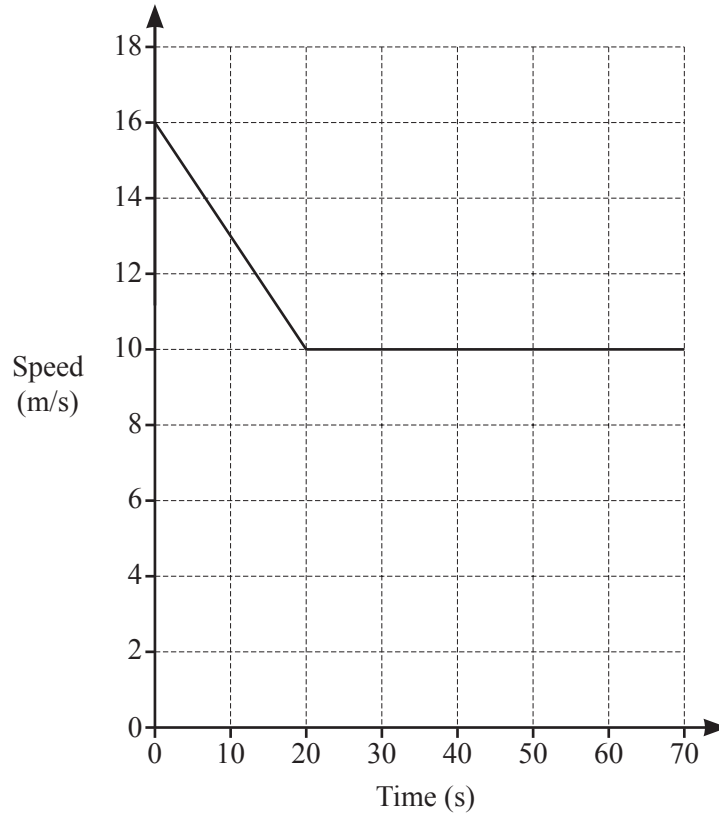
{.....} [1]

(b) In each Venn diagram, shade the required region.



[2]





The diagram shows the speed–time graph for 70 seconds of a car journey.

(a) Calculate the deceleration of the car during the first 20 seconds.

..... m/s² [1]

(b) Calculate the total distance travelled by the car during the 70 seconds.

..... m [3]



20 t is inversely proportional to the square of $(x + 1)$.
When $x = 2$, $t = 5$.

(a) Write t in terms of x .

$t = \dots\dots\dots$ [2]

(b) When $t = 1.8$, find the positive value of x .

$x = \dots\dots\dots$ [2]

21 (a) Work out the inverse of the matrix $\begin{pmatrix} -3 & 10 \\ 1 & -5 \end{pmatrix}$.

$\begin{pmatrix} & \\ & \end{pmatrix}$ [2]

(b) Work out the value of x and the value of y in this matrix calculation.

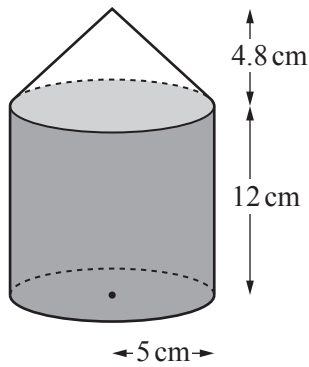
$$\begin{pmatrix} 1 & 5 \\ 2 & y \end{pmatrix} \begin{pmatrix} -4 & 1 \\ 2 & 9 \end{pmatrix} = \begin{pmatrix} x & 46 \\ 6 & 65 \end{pmatrix}$$

$x = \dots\dots\dots$

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

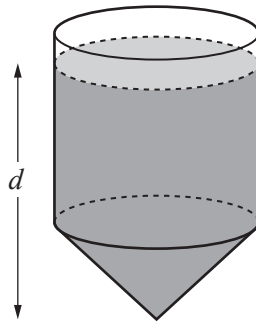


- 22 A container is made from a cylinder and a cone, each of radius 5 cm.
The height of the cylinder is 12 cm and the height of the cone is 4.8 cm.



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The cylinder is filled completely with water.
The container is turned upside down as shown below.



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Calculate the depth, d , of the water.

[The volume, V , of a cone with radius r and height h is $V = \frac{1}{3}\pi r^2 h$.]

$d = \dots\dots\dots$ cm [5]

Question 23 is printed on the next page.



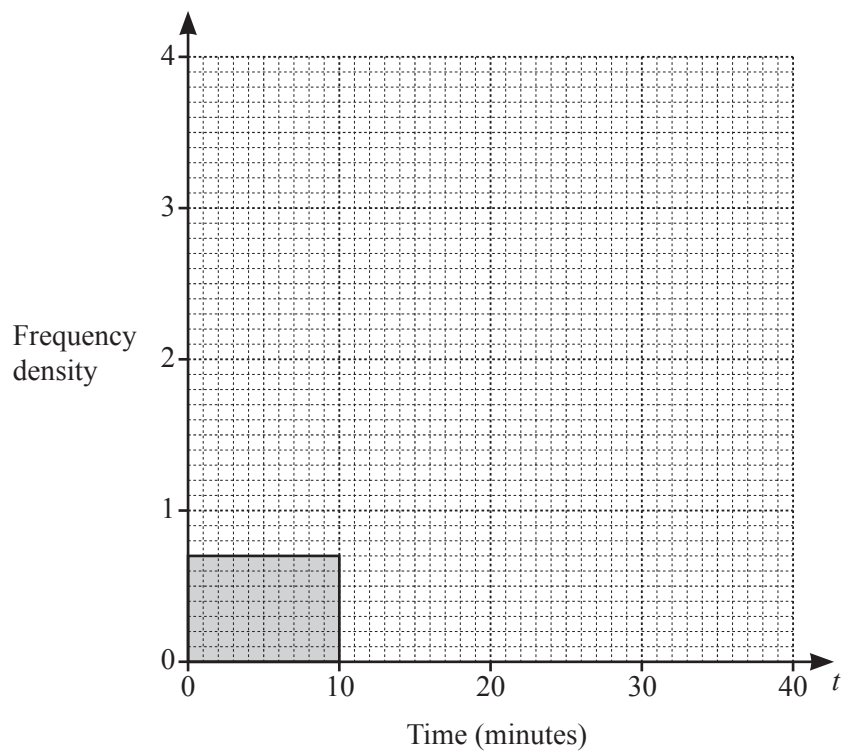
- 23 The time, t minutes, it takes each of 50 students to travel to school is recorded. The table shows the results.

Time (t minutes)	$0 < t \leq 10$	$10 < t \leq 15$	$15 < t \leq 20$	$20 < t \leq 40$
Frequency	7	19	16	8

- (a) Write down the modal class.

..... $< t \leq$ min [1]

- (b) On the grid, complete the histogram to show the information in the table.



[3]

