1 At noon, the temperature is 4 °C.
At midnight, the temperature is −9 °C.

Work out the difference in temperature between noon and midnight.

..... °C [1]

2 Thibault records the number of cars of each colour in a car park.

Colour	Black	White	Silver	Red
Number of cars	8	5	4	3

He draws a pie chart to show this information.

Calculate the sector angle for the red cars.

..... [2]

3 Figs cost 43 cents each.
Lyra has $5 to buy some figs.

Calculate the largest number of figs Lyra can buy and the amount of change, in cents, she receives.

..... figs and ..... cents change [3]

4 Find the value of $\sqrt{68} \times \sqrt{153}$.

..... [1]

5 Find the total surface area of a cuboid with length 8 cm, width 6 cm and height 3 cm.

..... cm^2 [3]

6 Some cards have either a square, a circle or a triangle drawn on them.
Piet chooses one of the cards at random.

Complete the table to show the probability of choosing a card with each shape.

Shape	Square	Circle	Triangle
Probability	0.2	0.32	

[2]

7 The price of a coat is $126.
In a sale, this price is reduced by 18%.

Find the sale price of the coat.

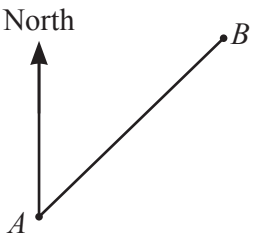
$ ..... [2]

8 The nth term of a sequence is $n^2 + 12$.

Find the first three terms of this sequence.

..... , ... , ... [2]

9



NOT TO SCALE

The bearing of B from A is 059°.

Work out the bearing of A from B.

..... [2]

10 $\mathbf{p} = \begin{pmatrix} 2 \\ 8 \end{pmatrix}$ $\mathbf{q} = \begin{pmatrix} -1 \\ 4 \end{pmatrix}$

(a) Find

(i) $\mathbf{p} - \mathbf{q}$,

( ) [1]

(ii) $6\mathbf{p}$.

( ) [1]

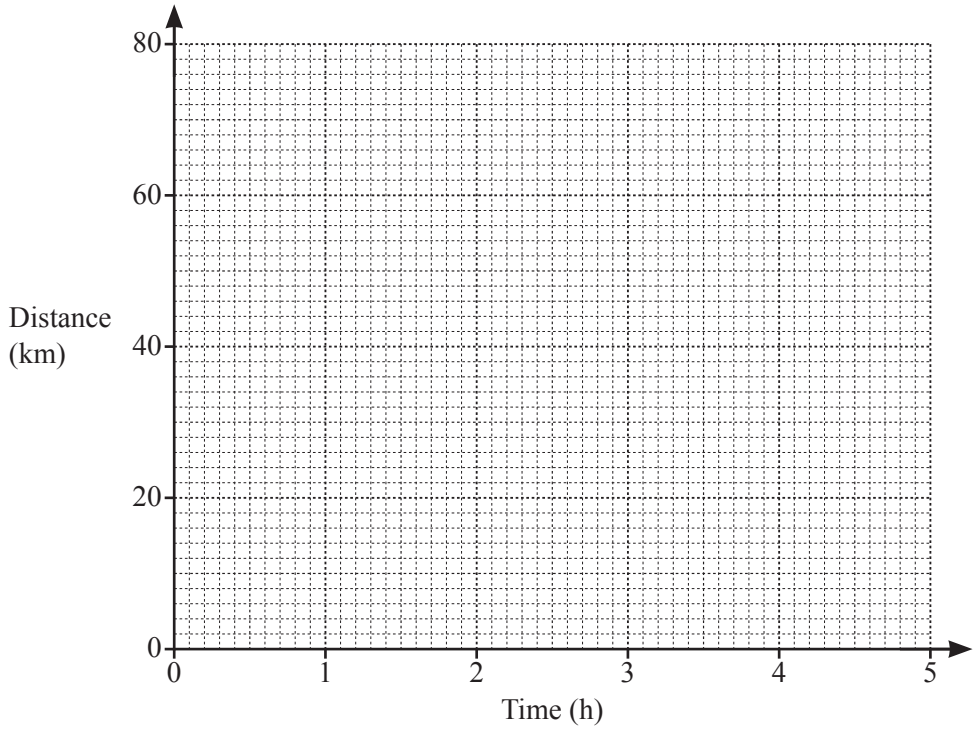
(b) Find $|\mathbf{p} - \mathbf{q}|$.

..... [2]

11 Find the value of p when $6^p \times 6^4 = 6^{28}$.

$p =$ ..... [1]

12 Annette cycles a distance of 70 km from Midville to Newtown.
Leaving Midville, she cycles for 1 hour 30 minutes at a constant speed of 20 km/h and then stops for 30 minutes.
She then continues the journey to Newtown at a constant speed of 16 km/h.



(a) On the grid, draw the distance–time graph for the journey. [3]

(b) Calculate the average speed for the whole journey.

..... km/h [3]

13 **Without using a calculator**, work out $4\frac{1}{8} - 2\frac{5}{6}$.

You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

14 Carlos invests \$4540 at a rate of r% per year compound interest.
At the end of 10 years he has earned \$1328.54 in interest.

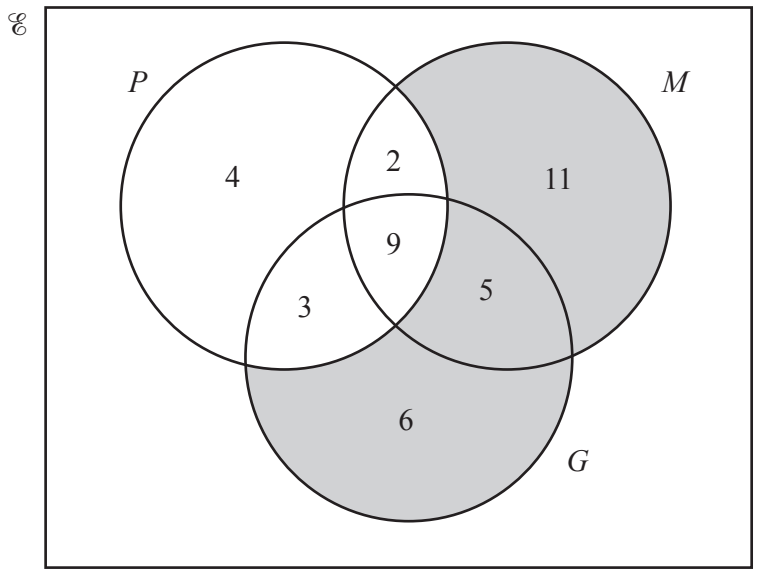
Calculate the value of r.

$r =$ ..... [3]

15 Find the highest common factor (HCF) of $12a^3b$ and $20a^2b^2$.

..... [2]

16 The Venn diagram shows the number of students in a class of 40 who study physics (P), mathematics (M) and geography (G).



(a) Use set notation to describe the shaded region.

..... [1]

(b) Find $\mathrm{n}((P \cap G) \cup M')$.

..... [1]

(c) A student is chosen at random from those studying geography.

Find the probability that this student also studies physics or mathematics but not both.

..... [2]

17 **(a)** Sketch the graph of $y = \sin x$ for $0° \leqslant x \leqslant 360°$.

[2]

(b) Solve the equation $3\sin x + 1 = 0$ for $0° \leqslant x \leqslant 360°$.

$x =$ ..... or $x =$ ..... [3]

18 **(a)** y is directly proportional to the cube root of $(x+1)$.
When $x = 7$, $y = 1$.

Find the value of y when $x = 124$.

$y =$ ..... [3]

(b) F is inversely proportional to the square of d.

Explain what happens to F when d is halved.

..... [1]

19 $f(x) = 7x - 8$ $g(x) = \frac{4}{x} + 5$ $h(x) = 2^x + 1$

(a) Find $f^{-1}(x)$.

$f^{-1}(x) =$ ..... [2]

(b) Find the value of x when $h(x) = g\left(\frac{1}{3}\right)$.

$x =$ ..... [2]

20 Factorise completely.

(a) $2m + 3p - 8km - 12kp$

..... [2]

(b) $5x^2 - 20y^2$

..... [3]

21 The nth term of a sequence is $an^2 + bn - 4$.

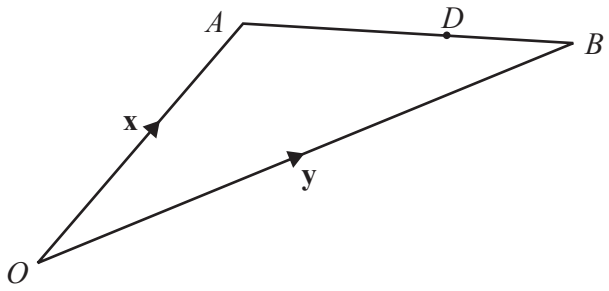
The first term is -3 and the second term is 2.

Find the value of a and the value of b.

$a =$ .....

$b =$ ..... [5]

22



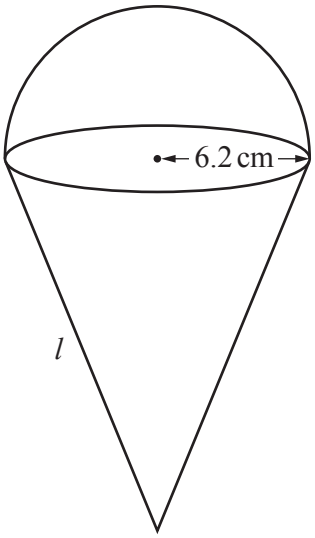
NOT TO SCALE

$\overrightarrow{OA} = \mathbf{x}$, $\overrightarrow{OB} = \mathbf{y}$ and $\overrightarrow{OD} = \frac{3}{7}\mathbf{x} + \frac{4}{7}\mathbf{y}$.

Calculate the ratio $AD : DB$.

..... : ..... [2]

23



NOT TO SCALE

The diagram shows a solid metal shape made from a cone and a hemisphere, both with radius 6.2 cm. The total surface area of the solid shape is 600 cm^2.

Calculate the slant height, l, of the cone.

$l =$ ..... cm [4]