



1 During one week in April, in Quebec, the daily minimum temperatures were

-5°C, -1°C, 3°C, 2°C, -2°C, 0°C, 6°C.

Write down

(a) the lowest of these temperatures,

Answer(a) ..... °C [1]

(b) the range of these temperatures.

Answer(b) ..... °C [1]

2  $\sqrt{23}$  48% 4.80  $\frac{53}{11}$

Write the numbers in order of size with the **largest** first.

Answer ..... > ..... > ..... > ..... [2]

3 Ricardo changed \$600 into pounds (£) when the exchange rate was \$1 = £0.60.  
He later changed all the pounds back into dollars when the exchange rate was \$1 = £0.72.

How many dollars did he receive?

Answer \$ ..... [2]

4 The maximum speed of a car is 252 km/h.

Change this speed into metres per second.

Answer ..... m/s [2]

5 Amalie makes a profit of 20% when she sells a shirt for \$21.60.

Calculate how much Amalie paid for the shirt.

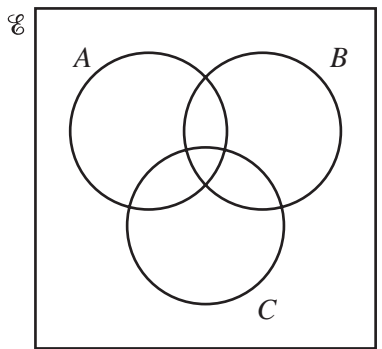
Answer \$ ..... [2]

6  $3^x \times 9^4 = 3^n$ .

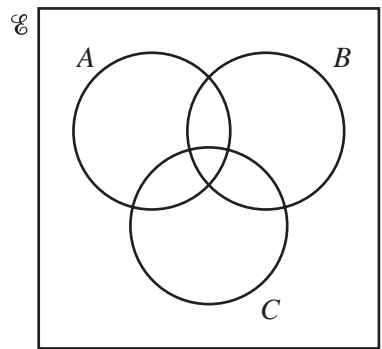
Find  $n$  in terms of  $x$ .

Answer  $n =$  ..... [2]

7 Shade the required regions in the Venn diagrams below.



$(A \cup B)' \cap C$



$(A \cap B) \cup C$

[2]

8 Write as a single fraction in its simplest form

$$\frac{x}{3} + \frac{x-1}{2}$$

Answer ..... [2]

9 1 second =  $10^6$  microseconds.

Change  $3 \times 10^{13}$  microseconds into minutes. Give your answer in standard form.

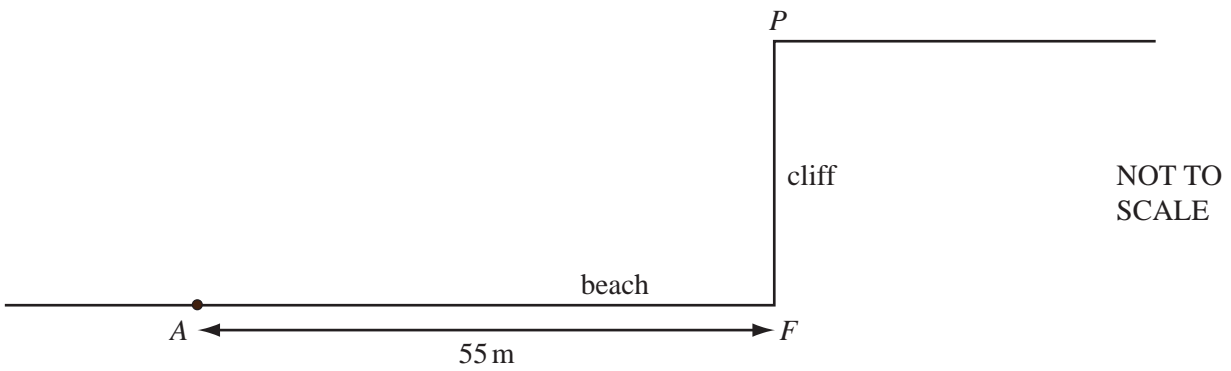
Answer ..... min [2]

10 The length of each side of an equilateral triangle is 74 mm, correct to the nearest millimetre.

Calculate the smallest possible perimeter of the triangle.

Answer ..... mm [2]

11



The diagram shows a point  $P$  at the top of a cliff.  
 The point  $F$  is on the beach and vertically below  $P$ .  
 The point  $A$  is 55 m from  $F$ , along the horizontal beach.  
 The angle of elevation of  $P$  from  $A$  is  $17^\circ$ .

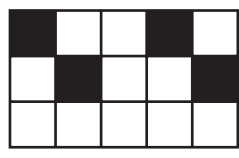
Calculate  $PF$ , the height of the cliff.

Answer  $PF =$  ..... m [3]

12 Expand and simplify  $2(x - 3)^2 - (2x - 3)^2$ .

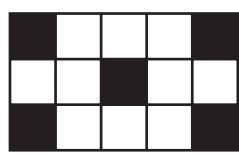
Answer ..... [3]

13 (a) Write down the number of lines of symmetry for the diagram below.



Answer(a) ..... [1]

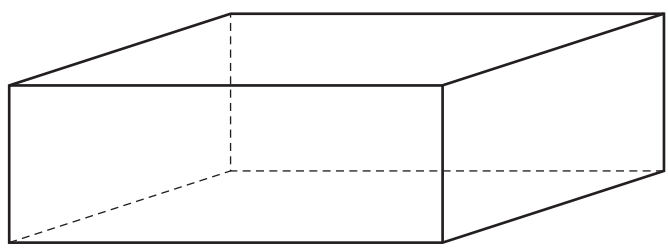
(b) Write down the order of rotational symmetry for the diagram below.



Answer(b) ..... [1]

(c) The diagram shows a cuboid which has no square faces.

Draw one of the **planes** of symmetry of the cuboid on the diagram.



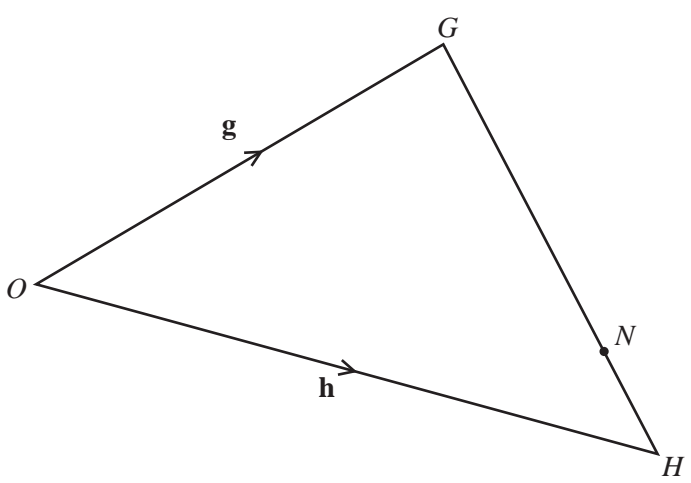
[1]

14 Solve the equation

$$3(y - 4) + \frac{y}{2} = 9.$$

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

15



In triangle  $OGH$ , the ratio  $GN : NH = 3 : 1$ .

$$\vec{OG} = \mathbf{g} \text{ and } \vec{OH} = \mathbf{h}.$$

Find the following in terms of  $\mathbf{g}$  and  $\mathbf{h}$ , giving your answers in their simplest form.

(a)  $\vec{HG}$

Answer(a)  $\vec{HG} =$  ..... [1]

(b)  $\vec{ON}$

Answer(b)  $\vec{ON} =$  ..... [2]

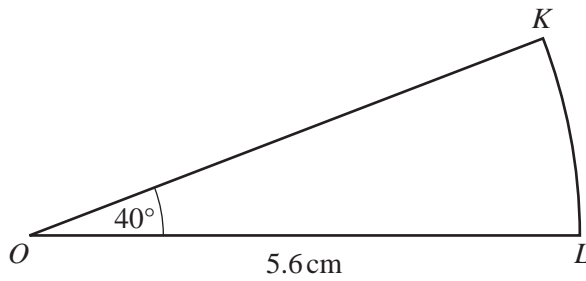
16 Make  $y$  the subject of the formula.

$$A = \frac{r(y+2)}{5}$$

Answer  $y =$

[3]

17



NOT TO  
SCALE

$OKL$  is a sector of a circle, centre  $O$ , radius 5.6 cm.  
Angle  $KOL = 40^\circ$ .

Calculate

(a) the area of the sector,

Answer(a) .....  $\text{cm}^2$  [2]

(b) the perimeter of the sector.

Answer(b) ..... cm [2]

18  $f(x) = x^2 + 2$        $g(x) = (x + 2)^2$        $h(x) = 3x - 5$

Find

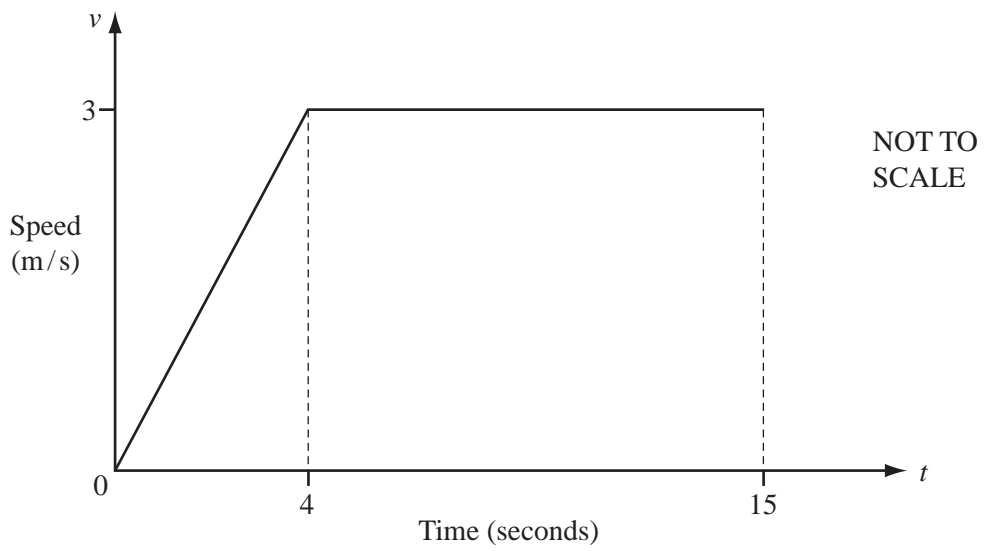
(a)  $gf(-2)$ ,

Answer(a) ..... [2]

(b)  $h^{-1}(22)$ .

Answer(b) ..... [2]

19



The diagram shows the speed-time graph for 15 seconds of the journey of a cyclist.

(a) Calculate the acceleration of the cyclist during the first 4 seconds.

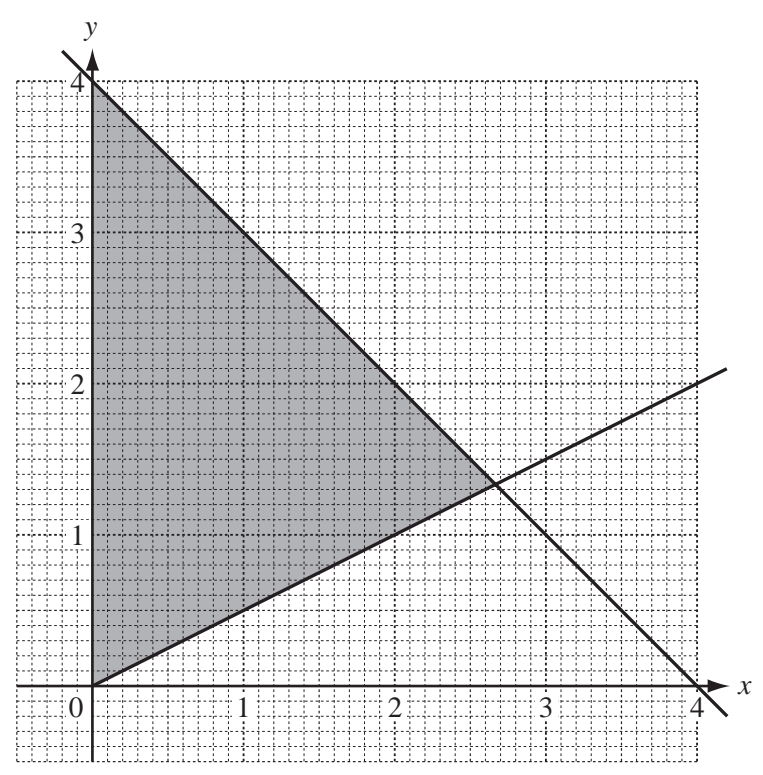
Answer(a) .....  $m/s^2$  [1]

(b) Calculate the average speed for the first 15 seconds.

Answer(b) .....  $m/s$  [3]



20

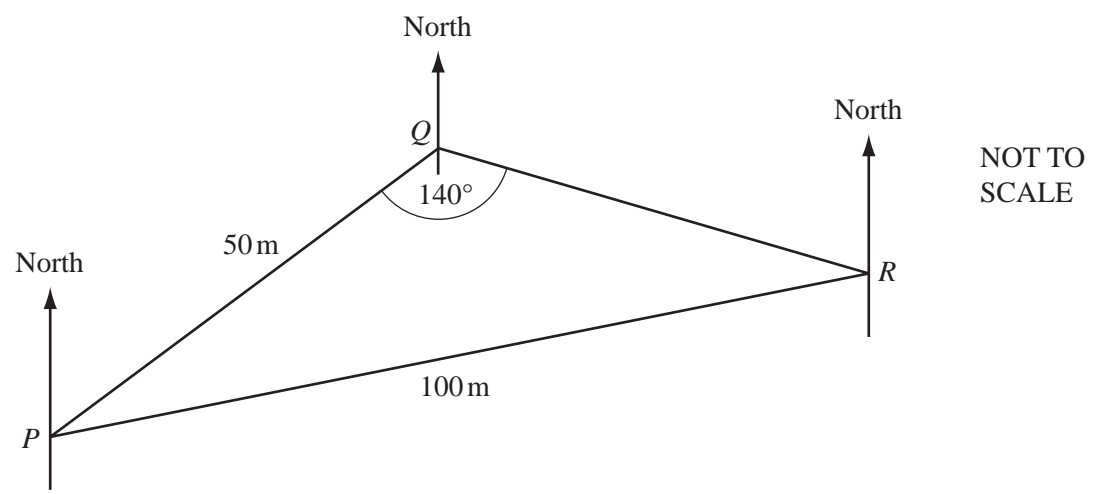


Find the three inequalities which define the shaded region on the grid.

Answer .....  
.....  
.....

[5]

21



The diagram shows three points  $P$ ,  $Q$  and  $R$  on horizontal ground.

$PQ = 50$  m,  $PR = 100$  m and angle  $PQR = 140^\circ$ .

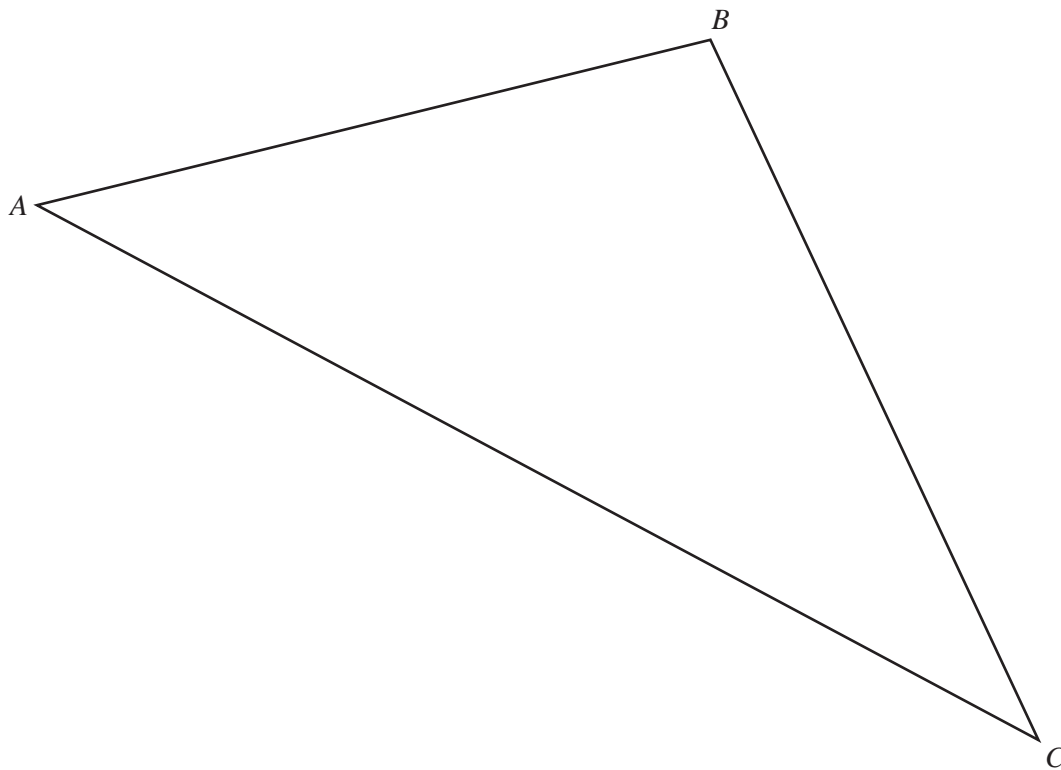
(a) Calculate angle  $PRQ$ .

Answer(a) Angle  $PRQ = \dots\dots\dots$  [3]

(b) The bearing of  $R$  from  $Q$  is  $100^\circ$ .

Find the bearing of  $P$  from  $R$ .

Answer(b)  $\dots\dots\dots$  [2]



The diagram shows a farmer's field  $ABC$ .

The farmer decides to grow potatoes in the region of the field which is

- nearer to  $A$  than to  $C$

**and**

- nearer to  $AB$  than to  $AC$ .

Using a **straight edge and compasses only**, construct two loci accurately and shade this region on the diagram.

[5]

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Question 23 is printed on the next page.

23

$$\mathbf{A} = \begin{pmatrix} 1 & 4 \end{pmatrix}$$

$$\mathbf{B} = \begin{pmatrix} 3 & -1 \\ -2 & 2 \end{pmatrix}$$

Find

(a)  $\mathbf{AB}$ ,

*Answer(a)*  $\mathbf{AB} =$  [2]

(b) the inverse matrix  $\mathbf{B}^{-1}$ ,

*Answer(b)*  $\mathbf{B}^{-1} =$  [2]

(c)  $\mathbf{BB}^{-1}$ .

*Answer(c)*  $\mathbf{BB}^{-1} =$  [1]