

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

(b) the range of these temperatures.

Answer(b) $^{\circ}\text{C}$ [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.

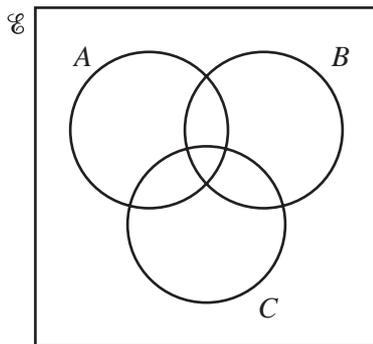
Answer \$ [2]

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

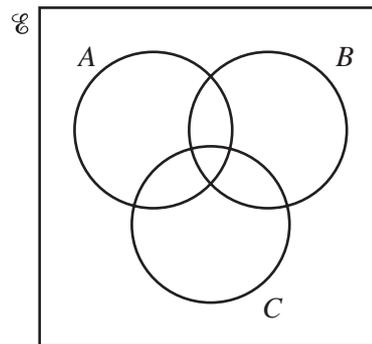
Find n in terms of x .

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 3×10^{13} microseconds into minutes. Give your answer in standard form.

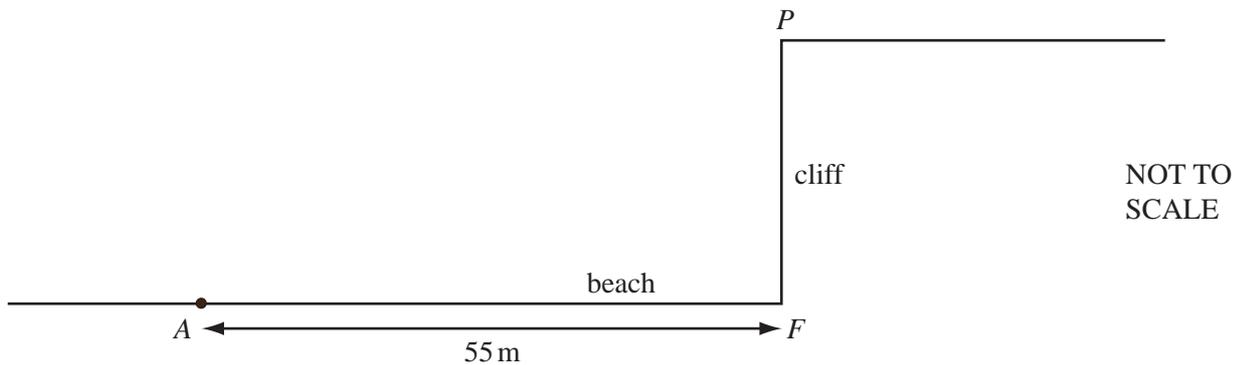
Answer min [2]

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° .

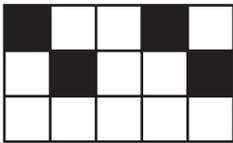
Calculate PF , the height of the cliff.

Answer $PF =$ m [3]

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

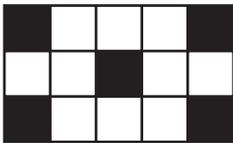
Answer [3]

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



Answer(a) [1]

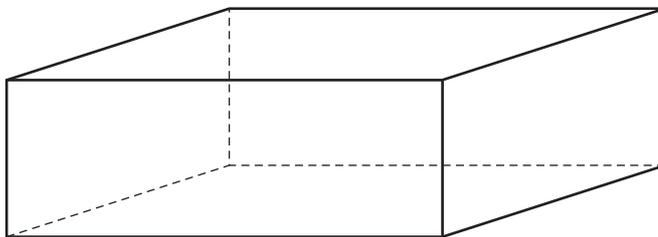
- (b) Write down the order of rotational symmetry for the diagram below.



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.



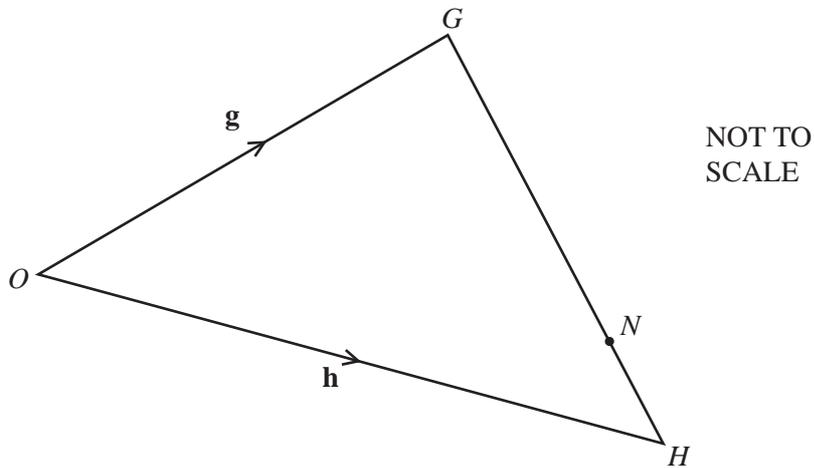
[1]

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]

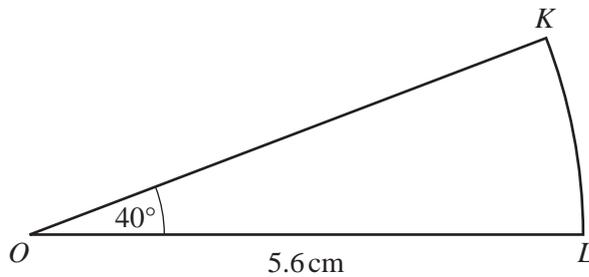
16 Make y the subject of the formula.

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

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) 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

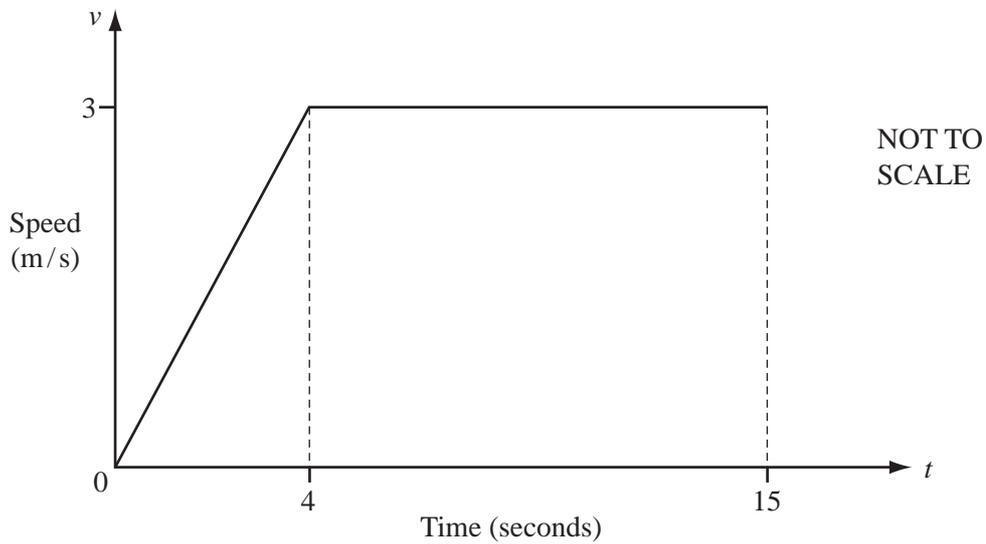
(a) $gf(-2)$,

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.

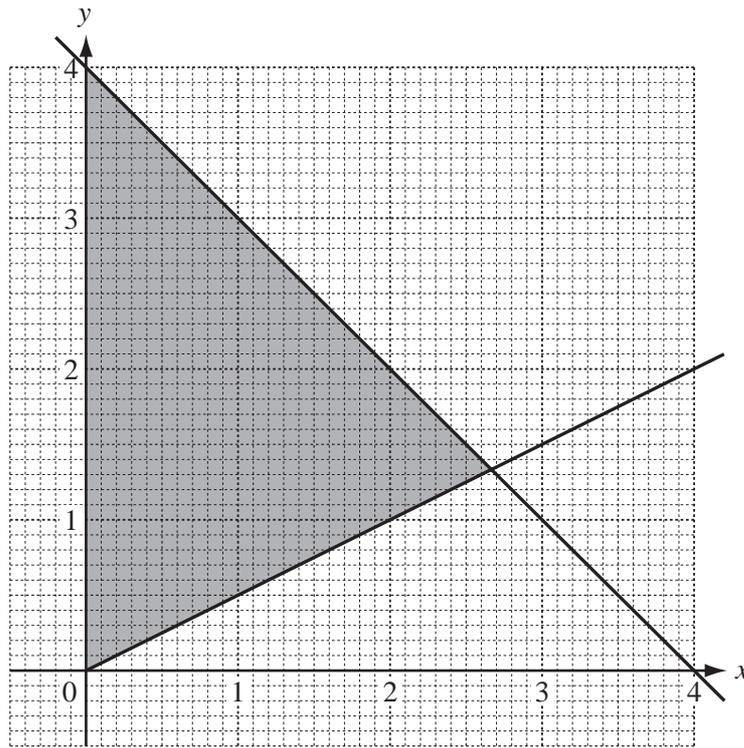
(a) Calculate the acceleration of the cyclist during the first 4 seconds.

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.

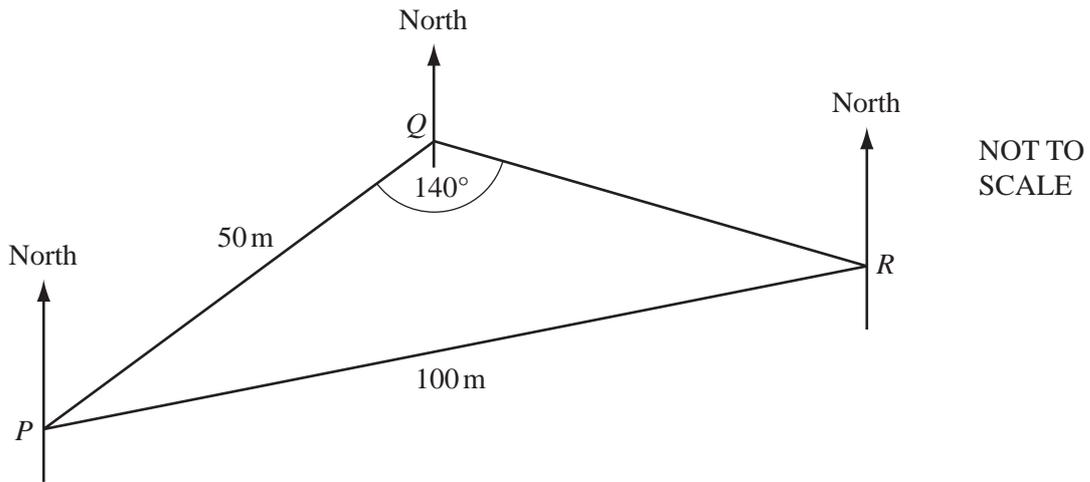
Answer

.....

.....

[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 .

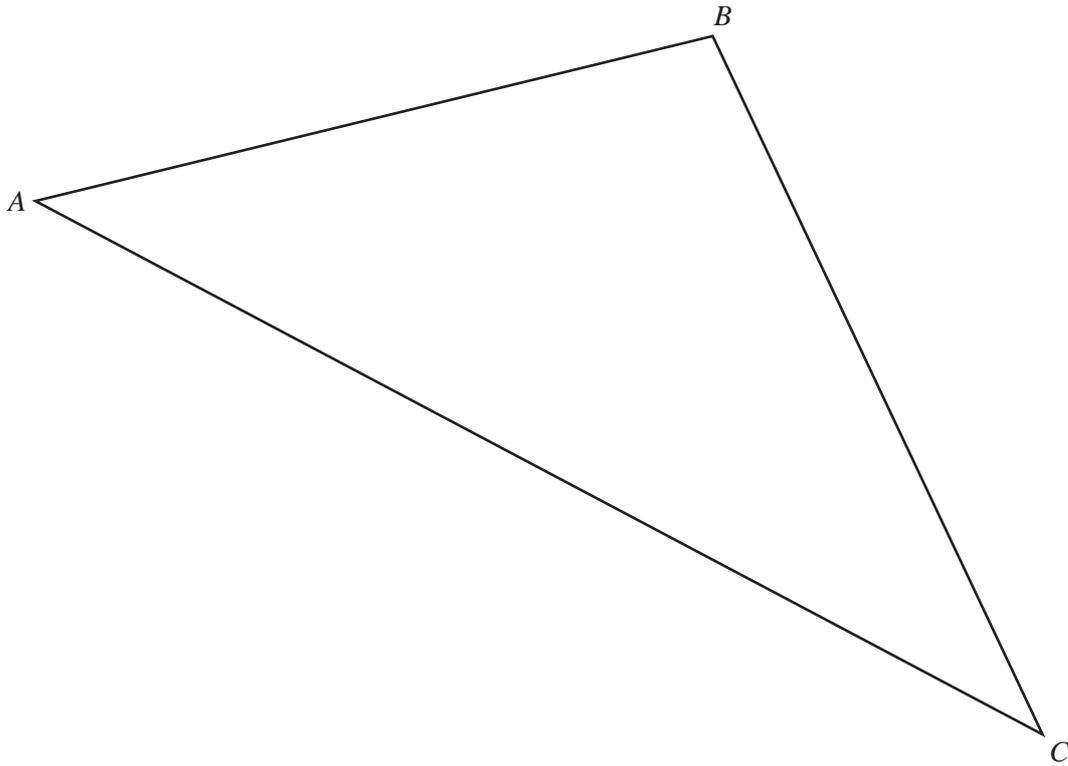
Answer(a) Angle $PRQ = \dots\dots\dots$ [3]

(b) The bearing of R from Q is 100° .

Find the bearing of P from R .

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

22



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]

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]
