

- 1 Write the numbers in order of size with the **smallest** first.

$$\sqrt{10} \qquad 3.14 \qquad \frac{22}{7} \qquad \pi$$

Answer < < < [2]

- 2 Michel changed \$600 into pounds (£) when the exchange rate was £1 = \$2.40.
He later changed all the pounds back into dollars when the exchange rate was £1 = \$2.60.

How many dollars did he receive?

Answer \$ [2]

- 3 p is the largest prime number between 50 and 100.
 q is the smallest prime number between 50 and 100.

Calculate the value of $p - q$.

Answer [2]

- 4 A person in a car, travelling at 108 kilometres per hour, takes 1 second to go past a building on the side of the road.

Calculate the length of the building in metres.

Answer m [2]

- 5 Calculate the value of $5(6 \times 10^3 + 400)$, giving your answer in standard form.

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Answer [2]

- 6 Calculate the value of $\frac{1}{2}\sqrt{\frac{1}{2} + \frac{1}{2}\sqrt{\frac{1}{2}}}$

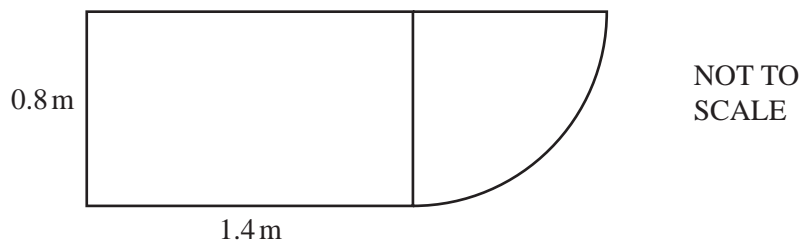
(a) writing down all the figures in your calculator answer,

Answer(a) [1]

(b) writing your answer correct to 4 significant figures.

Answer(b) [1]

7



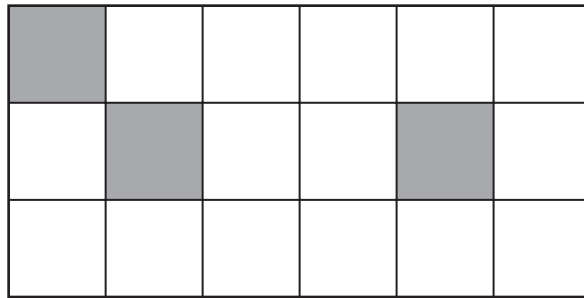
The top of a desk is made from a rectangle and a quarter circle.
The rectangle measures 0.8m by 1.4m.

Calculate the surface area of the top of the desk.

Answer m² [3]

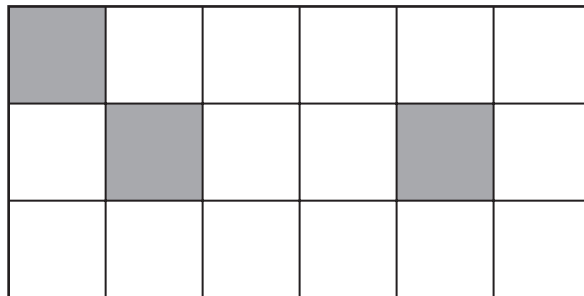
8 (a) Shade **one** square in each diagram so that there is

(i) one line of symmetry,



[1]

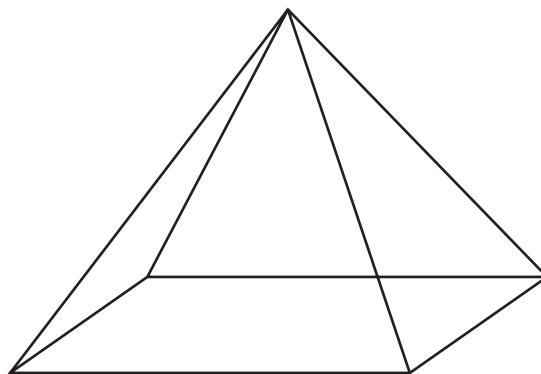
(ii) rotational symmetry of order 2.



[1]

(b) The pyramid below has a rectangular base.
The vertex of the pyramid is vertically above the centre of the base.

Write down the number of **planes** of symmetry for the pyramid.



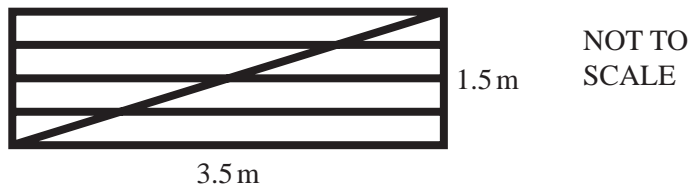
Answer(b) [1]

- 9 A cyclist left Melbourne on Wednesday 21 May at 09 45 to travel to Sydney.
The journey took 97 hours.

Write down the day, date and time that the cyclist arrived in Sydney.

Answer Day Date Time [3]

10



The diagram represents a rectangular gate measuring 1.5m by 3.5m.
It is made from eight lengths of wood.

Calculate the total length of wood needed to make the gate.

Answer m [3]

- 11 Make d the subject of the formula $c = \frac{5d + 4w}{2w}$.

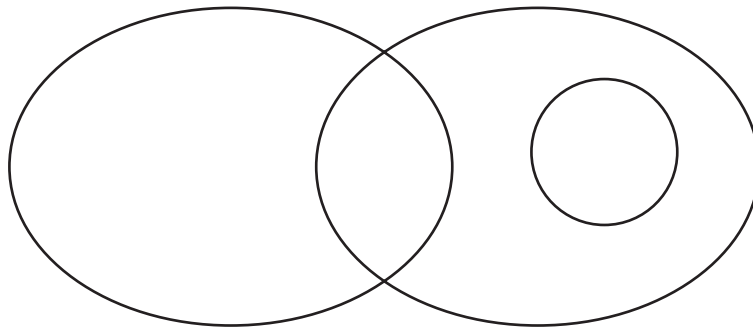
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Answer $d =$

[3]

- 12 $Q = \{2, 4, 6, 8, 10\}$ and $R = \{5, 10, 15, 20\}$.
 $15 \in P$, $n(P) = 1$ and $P \cap Q = \emptyset$.

Label each set and complete the Venn diagram to show this information.



[3]

- 13 Solve the simultaneous equations.

$$\frac{2x + y}{2} = 7$$

$$\frac{2x - y}{2} = 17$$

Answer $x =$

$y =$ [3]

- 14** y varies inversely as the square of x .
 $y = 1.5$ when $x = 8$.

Find y when $x = 5$.

Answer $y =$ [3]

- 15** The points $(2, 5)$, $(3, 3)$ and $(k, 1)$ all lie in a straight line.

(a) Find the value of k .

Answer(a) $k =$ [1]

(b) Find the equation of the line.

Answer(b) [3]

16 Simplify

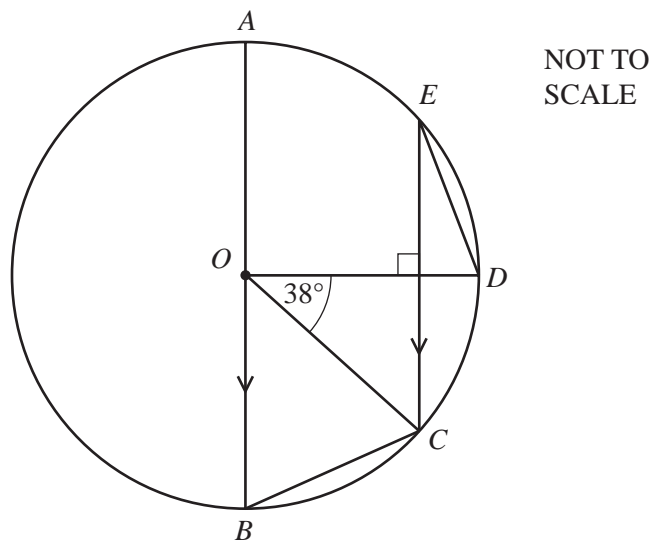
(a) $\left(\frac{p^4}{16}\right)^{0.75}$,

Answer(a) [2]

(b) $3^2q^{-3} \div 2^3q^{-2}$.

Answer(b) [2]

17



AB is the diameter of a circle, centre *O*. *C*, *D* and *E* lie on the circle. *EC* is parallel to *AB* and perpendicular to *OD*. Angle *DOC* is 38° .

Work out

(a) angle *BOC*,

Answer(a) Angle *BOC* = [1]

(b) angle *CBO*,

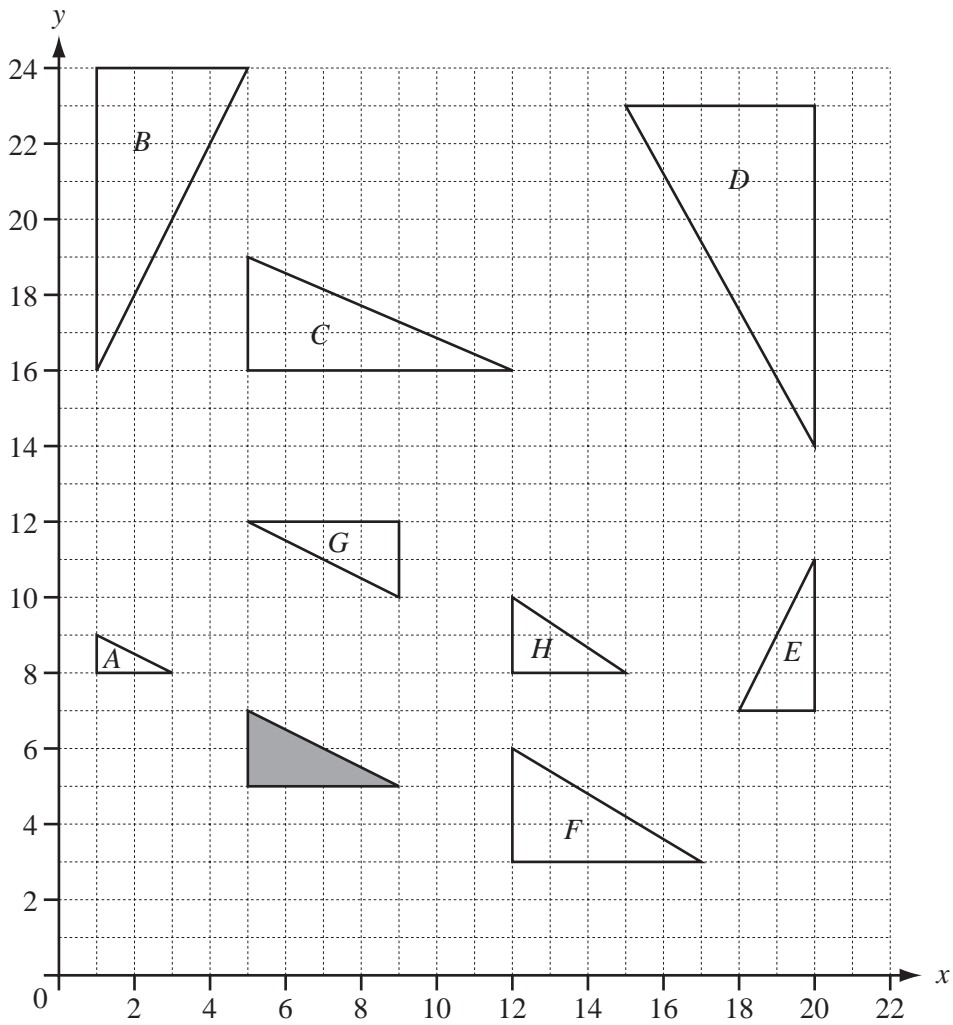
Answer(b) Angle *CBO* = [1]

(c) angle *EDO*.

Answer(c) Angle *EDO* = [2]

18

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Write down the letters of all the triangles which are

(a) congruent to the shaded triangle,

Answer(a) [2]

(b) similar, but not congruent, to the shaded triangle.

Answer(b) [2]

19 The position vector \mathbf{r} is given by $\mathbf{r} = 2\mathbf{p} + t(\mathbf{p} + \mathbf{q})$.

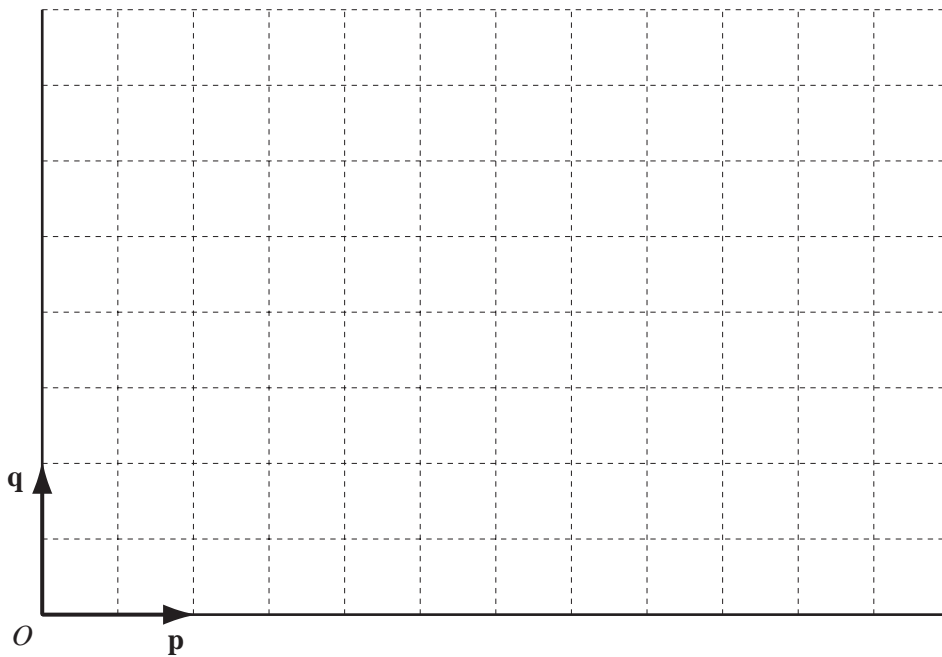
- (a) Complete the table below for the given values of t .
Write each vector in its simplest form.
One result has been done for you.

t	0	1	2	3
\mathbf{r}			$4\mathbf{p} + 2\mathbf{q}$	

[3]

(b) O is the origin and \mathbf{p} and \mathbf{q} are shown on the diagram.

- (i) Plot the 4 points given by the position vectors in the table.



[2]

- (ii) What can you say about these four points?

Answer(b)(ii) [1]

20 $f(x) = (x - 1)^3$ $g(x) = (x - 1)^2$ $h(x) = 3x + 1$

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(a) Work out $fg(-1)$.

Answer(a) [2]

(b) Find $gh(x)$ in its simplest form.

Answer(b) [2]

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

Answer(c) [2]

Question 21 is printed on the next page.

21 (a) **A** is a (2×4) matrix, **B** is a (3×2) matrix and **C** is a (1×3) matrix.

Which two of the following matrix products is it possible to work out?

A² **B**² **C**² **AB** **AC** **BA** **BC** **CA** **CB**

Answer(a) and [2]

(b) Find the inverse of $\begin{pmatrix} \frac{1}{2} & \frac{3}{4} \\ \frac{1}{8} & \frac{1}{4} \end{pmatrix}$.

Simplify your answer as far as possible.

Answer(b) $\begin{pmatrix} & \\ & \end{pmatrix}$ [3]

(c) Explain why the matrix $\begin{pmatrix} 4 & 2 \\ 6 & 3 \end{pmatrix}$ does not have an inverse.

Answer(c) [1]

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