

1 Work out 5% of \$25.

\$ ..... [1]

2 Factorise  $5p + pt$ .

..... [1]

3 Calculate.

$$\frac{16.379 - 0.879}{4.2} \times 1.241$$

Give your answer correct to 2 significant figures.

..... [2]

4 Write 15 060

(a) in words,

..... [1]

(b) in standard form.

..... [1]

5 Simplify  $5c - d - 3d - 2c$ .

..... [2]

6 Solve.

$$\frac{x-2}{3} = 3$$

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



7 Simplify  $2x^3 \times 3x^2$ .

..... [2]

8 **Without using a calculator**, work out  $\frac{5}{16} \times 1\frac{1}{7}$ .

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

..... [2]

9 Paula invests \$600 at a rate of  $r\%$  per year simple interest.  
At the end of 10 years, the total interest earned is \$90.

Find the value of  $r$ .

$r =$  ..... [2]

10 Simplify.  
 $\left(\frac{x^3}{8}\right)^{-\frac{4}{3}}$

..... [2]



11  $P = 2r + \pi r$

Rearrange the formula to write  $r$  in terms of  $P$  and  $\pi$ .

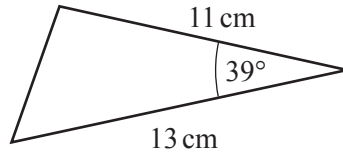
$r = \dots\dots\dots$  [2]

12 The sides of a square are 15.1 cm, correct to 1 decimal place.

Find the upper bound of the area of the square.

$\dots\dots\dots \text{ cm}^2$  [2]

13



NOT TO SCALE

Calculate the area of the triangle.

$\dots\dots\dots \text{ cm}^2$  [2]



- 14 The scale of a map is 1 : 10 000 000.  
On the map, the area of Slovakia is 4.9 cm<sup>2</sup>.

Calculate the actual area of Slovakia.  
Give your answer in square kilometres.

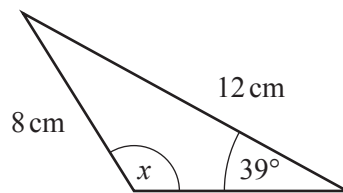
..... km<sup>2</sup> [3]

- 15  $y$  is inversely proportional to  $x^2$ .  
When  $x = 4$ ,  $y = 2$ .

Find  $y$  when  $x = \frac{1}{2}$ .

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

16



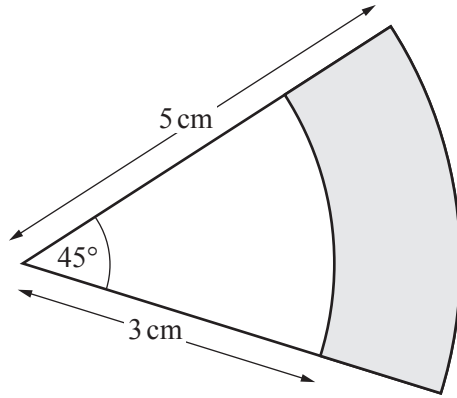
NOT TO  
SCALE

Calculate the **obtuse** angle  $x$  in this triangle.

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



17



NOT TO SCALE

The diagram shows two sectors of circles with the same centre.

Calculate the shaded area.

..... cm<sup>2</sup> [3]

18 Write  $\frac{x}{2} - \frac{2x+4}{x+1}$  as a single fraction, in its simplest form.

..... [3]



19  $\mathbf{M} = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$   $\mathbf{P} = \begin{pmatrix} 5 & 6 \\ 7 & 8 \end{pmatrix}$

(a) Find  $\mathbf{MP}$ .

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

(b) Find  $|\mathbf{M}|$ .

..... [1]

20 The probability that the school bus is late is  $\frac{9}{10}$ .

If the school bus is late, the probability that Seb travels on the bus is  $\frac{15}{16}$ .

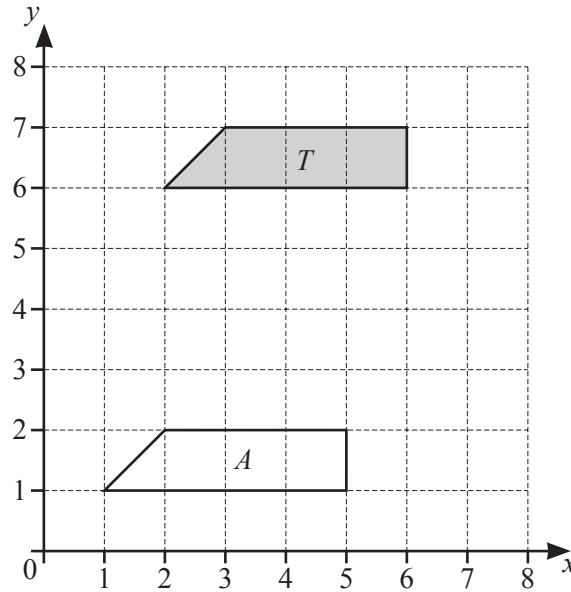
If the school bus is on time, the probability that Seb travels on the bus is  $\frac{3}{4}$ .

Find the probability that Seb travels on the bus.

..... [3]



21



(a) Describe fully the **single** transformation that maps shape *T* onto shape *A*.

.....  
 .....

[2]

(b) On the grid, reflect shape *T* in the line  $y = x$ .

[2]

22 A pipe is completely full of water.  
 Water flows through the pipe at a speed of 1.2 m/s into a tank.  
 The cross-section of the pipe has an area of 6 cm<sup>2</sup>.

Calculate the number of litres of water flowing into the tank in 1 hour.

..... litres [4]



23  $\mathcal{E} = \{0, 1, 2, 3, 4, 5, 6\}$        $A = \{0, 2, 4, 5, 6\}$        $B = \{1, 2, 5\}$

Complete each of the following statements.

$A \cap B = \{.....\}$

$n(B) = .....$

$\{0, 4, 6\} = ..... \cap .....$

$\{2, 4\} ..... A$  [4]

24       $f(x) = 3x - 5$        $g(x) = 2^x$

(a) Find  $fg(3)$ .

..... [2]

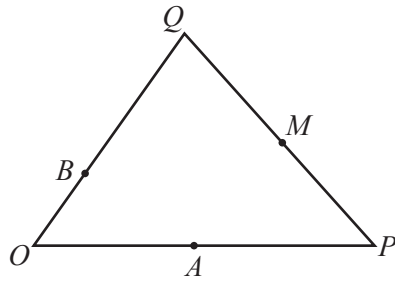
(b) Find  $f^{-1}(x)$ .

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





25



NOT TO SCALE

$O$  is the origin,  $\vec{OP} = 2\vec{OA}$ ,  $\vec{OQ} = 3\vec{OB}$  and  $\vec{PM} = \vec{MQ}$ .

$\vec{OP} = \mathbf{p}$  and  $\vec{OQ} = \mathbf{q}$ .

Find, in terms of  $\mathbf{p}$  and  $\mathbf{q}$ , in its simplest form

(a)  $\vec{BA}$ ,

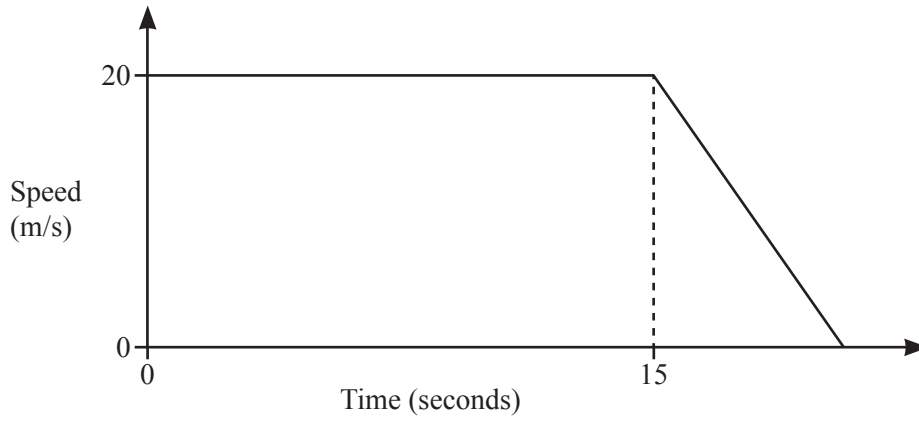
$\vec{BA} = \dots\dots\dots$  [2]

(b) the position vector of  $M$ .

$\dots\dots\dots$  [2]



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NOT TO SCALE

A car travels at 20 m/s for 15 seconds before it comes to rest by decelerating at  $2.5 \text{ m/s}^2$ .

Find the total distance travelled.

..... m [5]

