



2

1 Samantha invests \$600 at a rate of 2% per year simple interest.

Calculate the interest Samantha earns in 8 years.

Answer \$ ..... [2]

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2 Show that  $\left(\frac{1}{10}\right)^2 + \left(\frac{2}{5}\right)^2 = 0.17$ .

Write down all the steps in your working.

Answer

[2]

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3 Jamie needs 300 g of flour to make 20 cakes.

How much flour does he need to make 12 cakes?

Answer ..... g [2]

---

4 Expand the brackets.

$$y(3 - y^3)$$

Answer ..... [2]

---

3

5 Maria pays \$84 rent.  
The rent is increased by 5%.  
  
Calculate Maria's new rent.

Answer \$ ..... [2]

6

$\times^R$

$T^{\times}$

Using a straight edge and compasses only, construct the locus of points which are equidistant from  $R$  and from  $T$ . [2]

7 Find the value of  $\frac{7.2}{11.8 - 10.95}$ .

Give your answer correct to 4 significant figures.

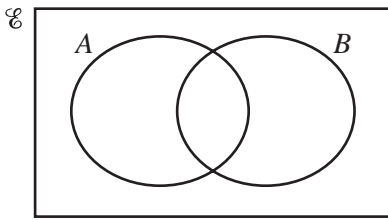
Answer ..... [2]

8 A carton contains 250 ml of juice, correct to the nearest millilitre.

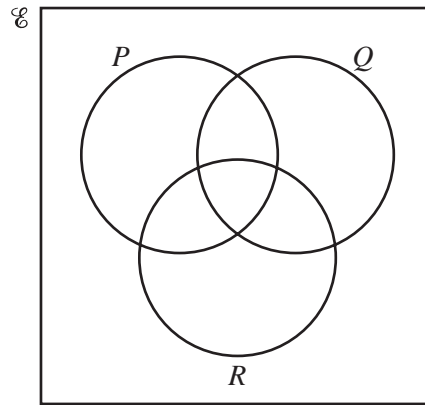
Complete the statement about the amount of juice,  $j$  ml, in the carton.

Answer .....  $\leq j <$  ..... [2]

9 Shade the required region in each of the Venn diagrams.



$A'$



$(P \cap R) \cup Q$

[2]

10 Without using a calculator, show that  $\left(\frac{49}{16}\right)^{-\frac{3}{2}} = \frac{64}{343}$ .

Write down all the steps in your working.

Answer

[2]

11 Simplify  $(256w^{256})^{\frac{1}{4}}$ .

Answer .....

[2]

12

Mass of parcel ( $m$ kilograms)	$0 < m \leq 0.5$	$0.5 < m \leq 1.5$	$1.5 < m \leq 3$
Frequency	20	18	9

The table above shows information about parcels in a delivery van.

John wants to draw a histogram using this information.

Complete the table below.

Mass of parcel ( $m$ kilograms)	$0 < m \leq 0.5$	$0.5 < m \leq 1.5$	$1.5 < m \leq 3$
Frequency density		18	

[2]

13 Write the following as a single fraction in its simplest form.

$$\frac{x+2}{3} - \frac{2x-1}{4} + 1$$

Answer ..... [3]

6

- 14  $y$  varies inversely as the square root of  $x$ .  
When  $x = 9, y = 6$ .

Find  $y$  when  $x = 36$ .

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

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- 15 A model of a ship is made to a scale of 1 : 200.  
The surface area of the model is  $7500 \text{ cm}^2$ .

Calculate the surface area of the ship, giving your answer in square metres.

Answer .....  $\text{m}^2$  [3]

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- 16 Make  $y$  the subject of the formula.

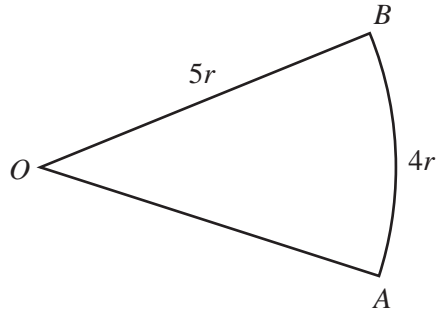
$$A = \pi x^2 - \pi y^2$$

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

---

7

17



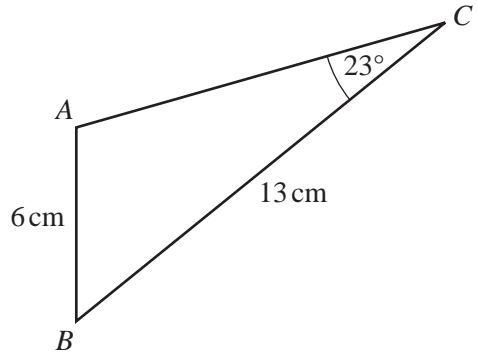
NOT TO  
SCALE

The diagram shows a sector of a circle, centre  $O$ , radius  $5r$ .  
The length of the arc  $AB$  is  $4r$ .

Find the area of the sector in terms of  $r$ , giving your answer in its simplest form.

Answer ..... [3]

18

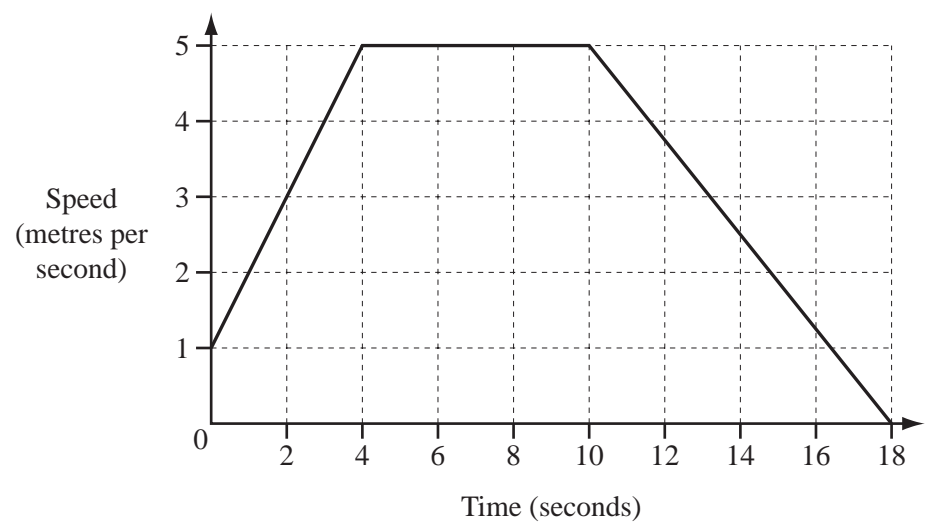


NOT TO  
SCALE

In triangle  $ABC$ ,  $AB = 6\text{ cm}$ ,  $BC = 13\text{ cm}$  and angle  $ACB = 23^\circ$ .  
Calculate angle  $BAC$ , which is obtuse.

Answer Angle  $BAC =$  ..... [4]

19



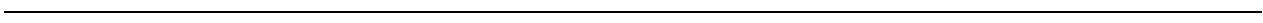
The diagram shows the speed-time graph for the last 18 seconds of Roman's cycle journey.

(a) Calculate the deceleration.

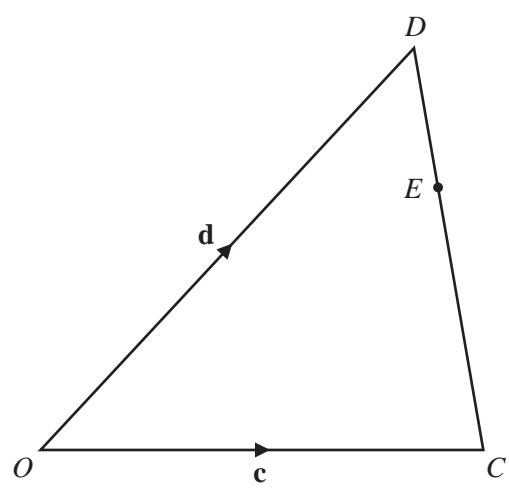
Answer(a) ..... m/s<sup>2</sup> [1]

(b) Calculate the total distance Roman travels during the 18 seconds.

Answer(b) ..... m [3]







NOT TO SCALE

In the diagram,  $O$  is the origin.  
 $\vec{OC} = \mathbf{c}$  and  $\vec{OD} = \mathbf{d}$ .  
 $E$  is on  $CD$  so that  $CE = 2ED$ .

Find, in terms of  $\mathbf{c}$  and  $\mathbf{d}$ , in their simplest forms,

(a)  $\vec{DE}$ ,

Answer(a)  $\vec{DE} = \dots\dots\dots$  [2]

(b) the position vector of  $E$ .

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

21 Simplify the following.

$$\frac{h^2 - h - 20}{h^2 - 25}$$

Answer ..... [4]

22 (a)  $M = \begin{pmatrix} 3 & 2 \\ -1 & 1 \end{pmatrix}$

Find  $M^{-1}$ , the inverse of  $M$ .

Answer(a)  $\begin{pmatrix} & \\ & \end{pmatrix}$  [2]

(b)  $D$ ,  $E$  and  $X$  are  $2 \times 2$  matrices.  
 $I$  is the identity  $2 \times 2$  matrix.

(i) Simplify  $DI$ .

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

(ii)  $DX = E$   
Write  $X$  in terms of  $D$  and  $E$ .

Answer(b)(ii)  $X =$  ..... [1]

23  $f(x) = 3x + 5$      $g(x) = 4x - 1$

(a) Find the value of  $gg(3)$ .

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

(b) Find  $fg(x)$ , giving your answer in its simplest form.

Answer(b)  $fg(x) =$  ..... [2]

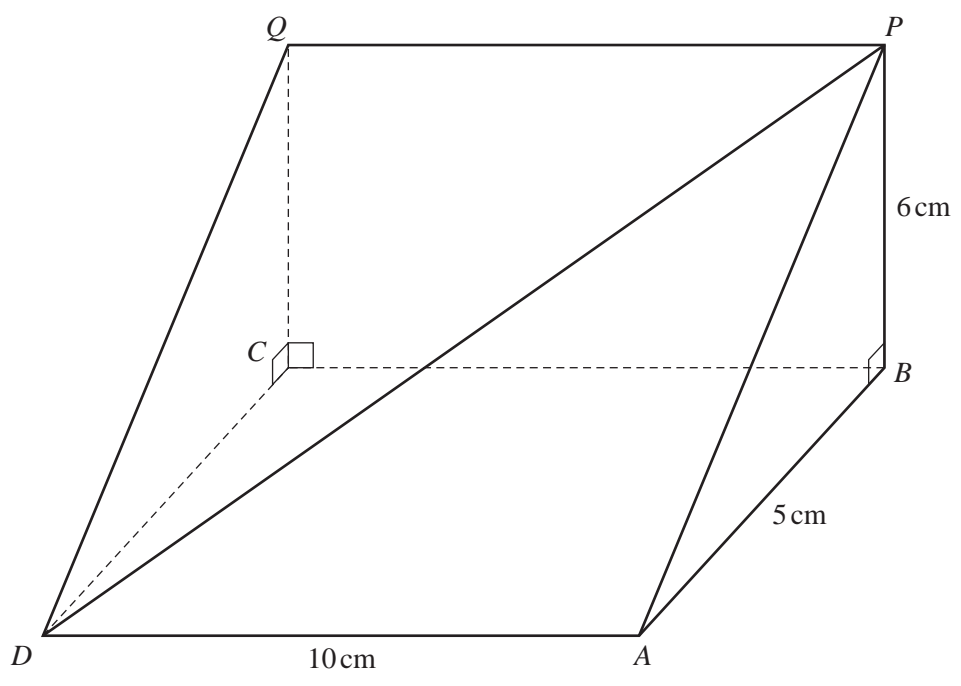
(c) Solve the equation.

$$f^{-1}(x) = 11$$

Answer(c)  $x =$  ..... [1]

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Question 24 is printed on the next page.



NOT TO  
SCALE

The diagram shows a triangular prism.  
 $ABCD$  is a horizontal rectangle with  $DA = 10$  cm and  $AB = 5$  cm.  
 $BCQP$  is a vertical rectangle and  $BP = 6$  cm.

Calculate

(a) the length of  $DP$ ,

Answer(a)  $DP =$  ..... cm [3]

(b) the angle between  $DP$  and the horizontal rectangle  $ABCD$ .

Answer(b) ..... [3]

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