



1 Calculate  $\frac{\sqrt[3]{16}}{1.3^2}$ .

Answer ..... [1]

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2 (a) Write 569 000 correct to 2 significant figures.

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

(b) Write 569 000 in standard form.

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

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3 Solve the simultaneous equations.

$$2x - y = 7$$

$$3x + y = 3$$

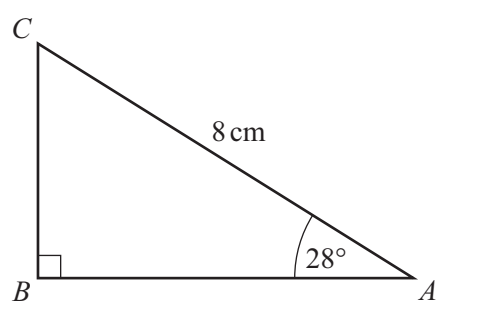
Answer  $x =$  .....

$y =$  ..... [2]

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3

4

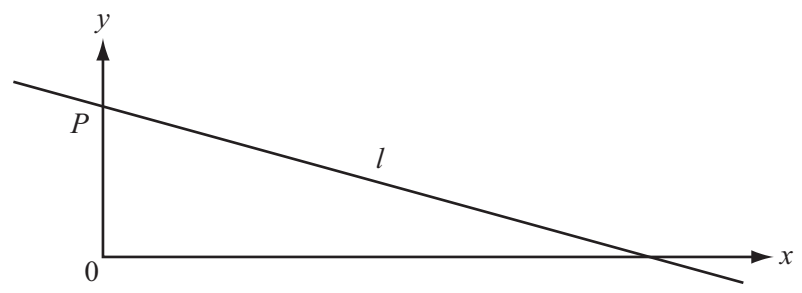


NOT TO SCALE

Calculate the length of AB.

Answer AB = ..... cm [2]

5



NOT TO SCALE

The equation of the line *l* in the diagram is  $y = 5 - x$ .

(a) The line cuts the y-axis at *P*.

Write down the co-ordinates of *P*.

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

(b) Write down the gradient of the line *l*.

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

6 The mass of 1 cm<sup>3</sup> of copper is 8.5 grams, correct to 1 decimal place.

Complete the statement about the total mass,  $T$  grams, of 12 cm<sup>3</sup> of copper.

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

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7 Write the following in order, smallest first.

$\sqrt{0.1}$        $\frac{43}{201}$        $2\frac{1}{2}\%$       0.2

Answer .....  $<$  .....  $<$  .....  $<$  ..... [2]

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8 Without using your calculator, work out  $\frac{5}{6} - \left(\frac{1}{2} \times 1\frac{1}{2}\right)$ .

Write down all the steps of your working.

Answer ..... [3]

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5

- 9 At the beginning of July, Kim had a mass of 63 kg.  
At the end of July, his mass was 61 kg.

Calculate the percentage loss in Kim's mass.

Answer ..... % [3]

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10  $V = \frac{1}{3}Ah$

- (a) Find  $V$  when  $A = 15$  and  $h = 7$ .

Answer(a)  $V =$  ..... [1]

- (b) Make  $h$  the subject of the formula.

Answer(b)  $h =$  ..... [2]

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- 11 Anita buys a computer for \$391 in a sale.  
The sale price is 15% less than the original price.

Calculate the original price of the computer.

Answer \$ ..... [3]

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- 12 Solve the equation.

$$\frac{3}{2x} + \frac{1}{x+1} = 0$$

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

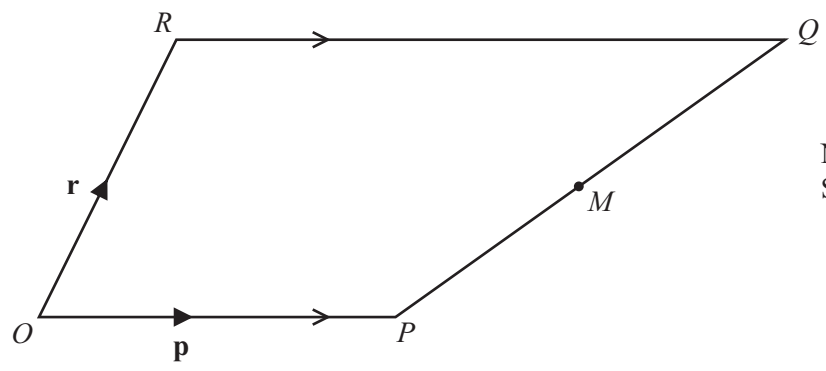
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13  $w$  varies inversely as the square root of  $x$ .  
When  $x = 4$ ,  $w = 4$ .

Find  $w$  when  $x = 25$ .

Answer  $w = \dots\dots\dots$  [3]

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$OPQR$  is a trapezium with  $RQ$  parallel to  $OP$  and  $RQ = 2OP$ .  
 $O$  is the origin,  $\vec{OP} = \mathbf{p}$  and  $\vec{OR} = \mathbf{r}$ .  
 $M$  is the midpoint of  $PQ$ .

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

(a)  $\vec{PQ}$ ,

Answer(a)  $\vec{PQ} = \dots\dots\dots$  [1]

(b)  $\vec{OM}$ , the position vector of  $M$ .

Answer(b)  $\vec{OM} = \dots\dots\dots$  [2]

15  $M = \begin{pmatrix} 4 & 2 \\ 3 & 5 \end{pmatrix}$

Find

(a)  $M^2$ ,

Answer(a) [2]

(b) the determinant of  $M$ .

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

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16 Factorise completely.

(a)  $4p^2q - 6pq^2$

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

(b)  $u + 4t + ux + 4tx$

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

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17 (a) Simplify  $(3125t^{125})^{\frac{1}{5}}$ .

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

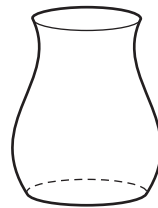
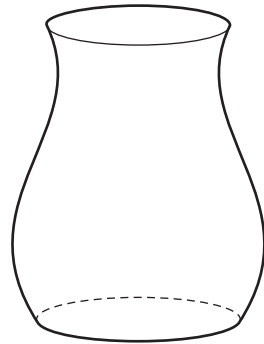
(b) Find the value of  $p$  when  $3^p = \frac{1}{9}$ .

Answer(b)  $p =$  ..... [1]

(c) Find the value of  $w$  when  $x^{72} \div x^w = x^8$ .

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

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NOT TO SCALE

The two containers are mathematically similar in shape.

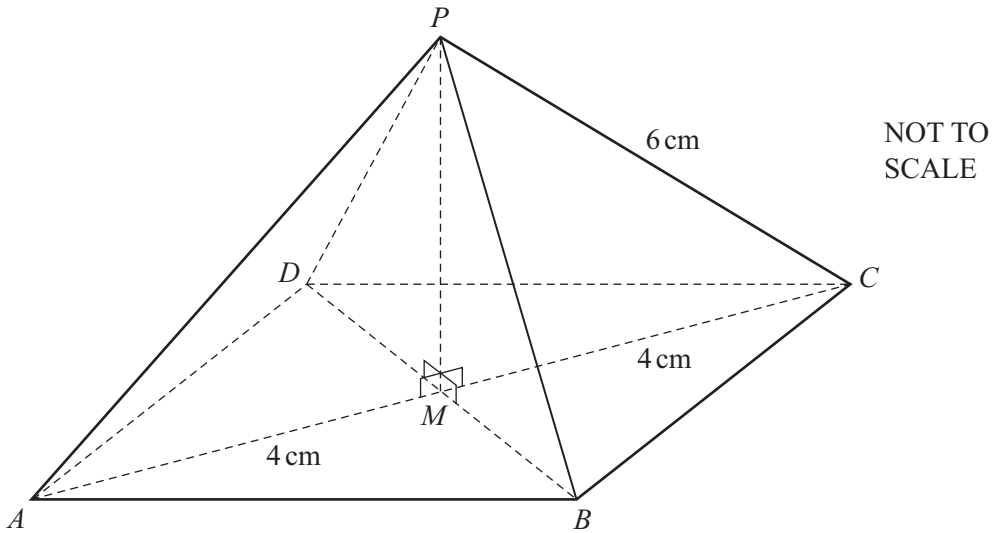
The larger container has a volume of  $3456 \text{ cm}^3$  and a surface area of  $1024 \text{ cm}^2$ .

The smaller container has a volume of  $1458 \text{ cm}^3$ .

Calculate the surface area of the smaller container.

Answer .....  $\text{cm}^2$  [4]





The diagram shows a pyramid on a square base  $ABCD$  with diagonals,  $AC$  and  $BD$ , of length 8 cm.  $AC$  and  $BD$  meet at  $M$  and the vertex,  $P$ , of the pyramid is vertically above  $M$ . The sloping edges of the pyramid are of length 6 cm.

Calculate

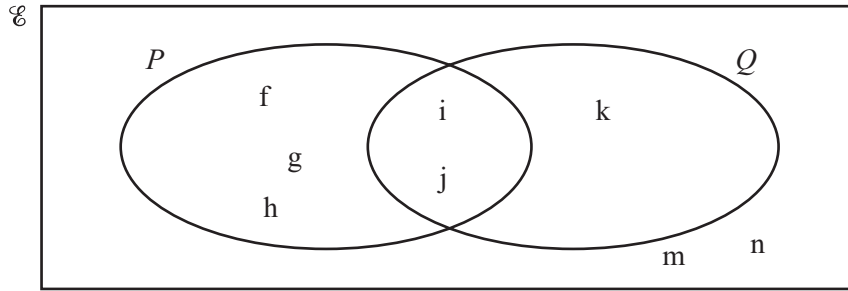
- (a) the perpendicular height,  $PM$ , of the pyramid,

Answer(a)  $PM = \dots\dots\dots$  cm [3]

- (b) the angle between a sloping edge and the base of the pyramid.

Answer(b)  $\dots\dots\dots$  [3]

Question 22 is printed on the next page.



(a) Use the information in the Venn diagram to complete the following.

(i)  $P \cap Q = \{ \dots \}$  [1]

(ii)  $P' \cup Q = \{ \dots \}$  [1]

(iii)  $n(P \cup Q)' = \dots$  [1]

(b) A letter is chosen at random from the set  $Q$ .

Find the probability that it is also in the set  $P$ .

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

(c) On the Venn diagram shade the region  $P' \cap Q$ . [1]

(d) Use a set notation symbol to complete the statement.

$\{f, g, h\}$  .....  $P$  [1]

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