

Answer ALL the questions.

Write your answers in the spaces provided.

You must show all of your working.

1 a and b are column vectors such that  $\mathbf{a} = \begin{pmatrix} 8 \\ 3 \end{pmatrix}$  and  $\mathbf{b} = \begin{pmatrix} 1 \\ -7 \end{pmatrix}$ . Calculate:

(a)  $3\mathbf{a}$

$$3 \times \begin{pmatrix} 8 \\ 3 \end{pmatrix} = \begin{pmatrix} 3 \times 8 \\ 3 \times 3 \end{pmatrix} = \begin{pmatrix} 24 \\ 9 \end{pmatrix}$$

[1]

(b)  $\mathbf{a} - 4\mathbf{b}$

$$\begin{pmatrix} 8 \\ 3 \end{pmatrix} - 4 \begin{pmatrix} 1 \\ -7 \end{pmatrix}$$

$$\begin{pmatrix} 8 \\ 3 \end{pmatrix} - \begin{pmatrix} 4 \\ -28 \end{pmatrix} = \begin{pmatrix} 8-4 \\ 3-(-28) \end{pmatrix} = \begin{pmatrix} 4 \\ 31 \end{pmatrix}$$

[2]

[Total 3 marks]

2 140% of x is 28.  
Find the value of x.

$$\frac{140}{100} \times x = 28$$

$$x = \frac{28 \times 100}{140} = 20$$

Alternate method

$$140\% = 28$$

$$10\% = 28 \div 14 = 2$$

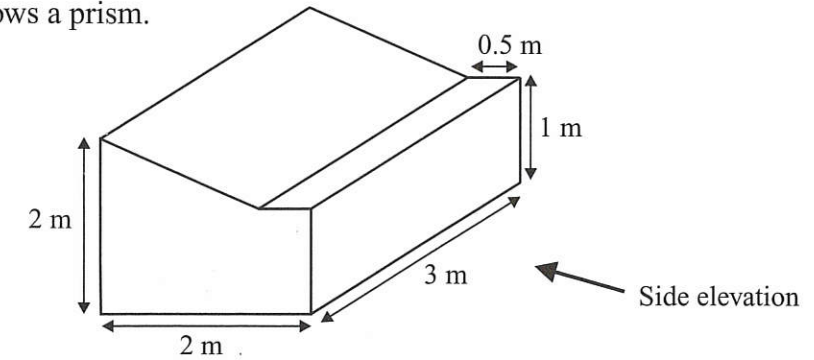
$$100\% = 2 \times 10 = 20$$

$$x = 20$$

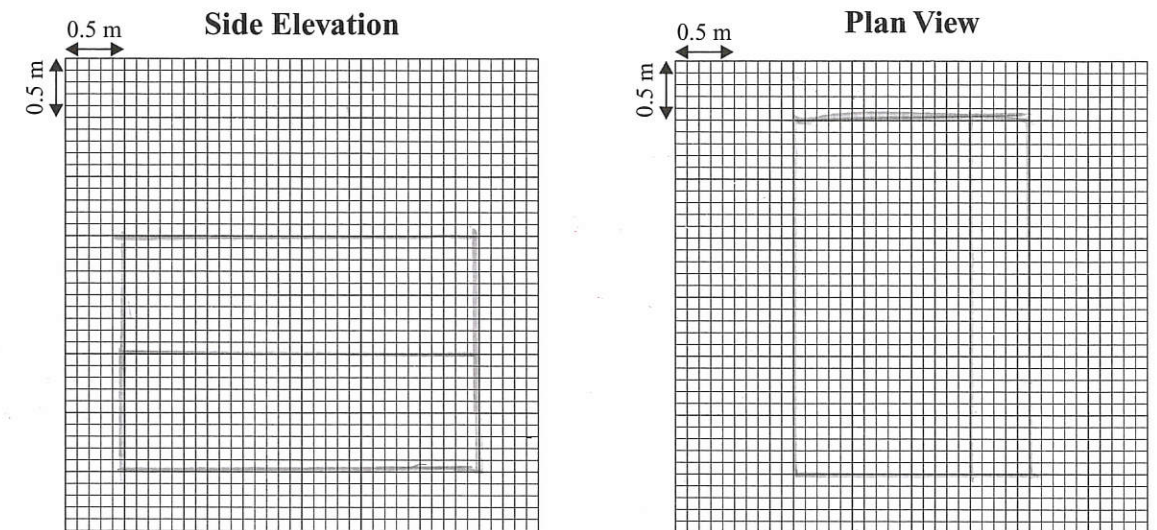
[Total 2 marks]

Leave blank

3 The diagram shows a prism.



Using the scale shown on the grids, accurately draw the side elevation and plan view of the prism.



[Total 2 marks]

4 (a) Make y the subject of the formula  $x = 3y - 5$

$$x = 3y - 5$$

$$+5 \quad +5$$

$$x + 5 = 3y \div 3$$

$$y = \frac{x+5}{3}$$

[2]

(b) Factorise the expression  $8x^2 - 12xy$

$$\text{HCF} \Rightarrow 4 \times x$$

$$4x(2x - 3y)$$

1 mark for  
1 correct factor

[2]

[Total 4 marks]

Leave blank

5 The sets  $\xi$ , P and Q are shown below.

$\xi = \{\text{positive integers less than or equal to } 20\}$

$P = \{\text{prime numbers}\}$

$Q = \{1, 2, 3, 4, 6, 8, 12\}$

(a) List the members of the set  $P \cap Q$

$\cap \Rightarrow$  intersect of P & Q

1 mark for 1 element omitted or an extra element given

2, 3

[2]

(b) Find  $n(P \cup Q)$

$\cup \Rightarrow$  union of P & Q

$(P \cup Q) = \{1, 2, 3, 4, 5, 6, 7, 8, 11, 12, 13, 17, 19\}$

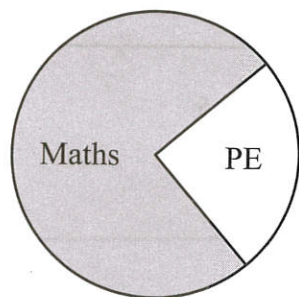
$n \Rightarrow$  number in the set.

13

[2]

[Total 4 marks]

6 Mathilde asks her group of friends whether they like Maths, PE or History lessons the most. She puts her results in a pie chart.



She claims that, "No one in my school likes History the most."

Do you agree with her statement? Explain your answer.

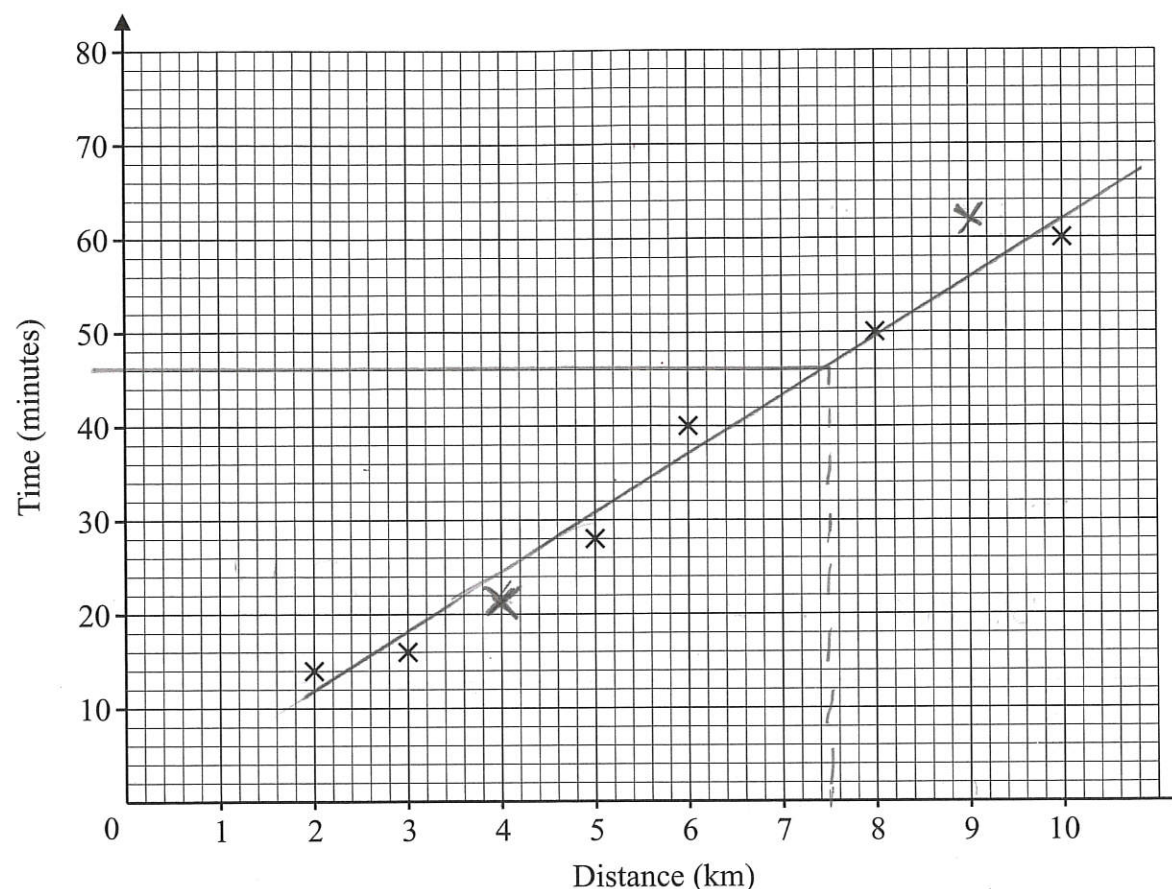
I disagree, she only asked her school & friends not the whole school, not a large enough sample

[Total 1 mark]

Leave blank

7 Dom has been training for a half marathon. He records the distances and times taken when he goes out running.

Leave blank



(a) Dom also completed a 4 km run in 21 minutes and a 9 km run in 62 minutes. Plot these points on the graph.

[1]

(b) Use the graph to estimate how long it would take him to run 7.5 km.

1 mark for line of best fit

46 minutes

[2]

(c) Why might you not expect the points to lie in a straight line?

because the greater the distance the potentially slower the runner might get greater distance  $\Rightarrow$  decrease speed

[Total 4 marks]

8 Alice has 2 dogs, Ollie and Taffy.  
Ollie eats  $\frac{2}{3}$  of a tin of dog food every day and Taffy eats  $\frac{2}{5}$  of a tin every day.  
Alice buys a crate of 24 tins.

How many whole days should the crate last?

$$\frac{2}{3} + \frac{2}{5} = \frac{10}{15} + \frac{6}{15} = \frac{16}{15} \text{ (1)}$$

$$24 \div \frac{16}{15} = 24 \times \frac{15}{16} = 3 \times \frac{15}{2} = \frac{45}{2} = 22.5$$

Use the trick  
of X then flip

22 (1) days  
[Total 3 marks]

9 Look at this calculation.

$$\frac{226 \times 0.074}{0.681}$$

(a) By rounding each number to 1 significant figure, work out an estimate to the calculation.

$$\text{(1)} \rightarrow \frac{200 \times 0.07}{0.7}$$

$$200 \times \frac{0.07 \times 10}{0.7 \times 10} = 200 \times \frac{0.7}{7}$$

$$= 200 \times 0.1$$

$$\begin{array}{r} 0.1 \\ 7 \overline{) 0.7} \end{array}$$

$$20 \text{ (1)}$$

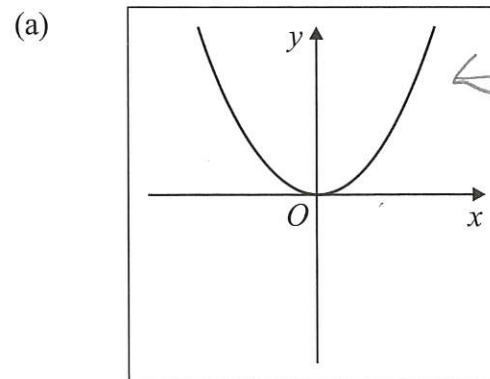
(b) Explain whether you think your answer to part (a) is an overestimate, underestimate or if it is impossible to tell.

underestimate as both numerators were rounded down & denominator rounded up & so will give a smaller answer  
[1]  
[Total 3 marks]

Leave blank

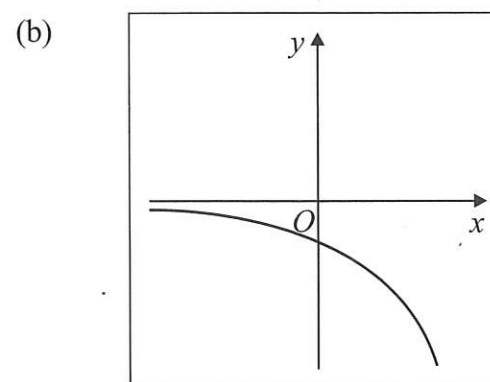
10 Choose an equation from the box to match each of the graphs below.

$y = \sin x$	$y = \cos x$	<del><math>y = x^2</math></del>	$y = -x^2$	$y = x^3$	$y = -x^3$
	<del><math>y = -2^x</math></del>	$y = 2^x$	<del><math>y = \frac{1}{x}</math></del>	$y = -\frac{1}{x}$	



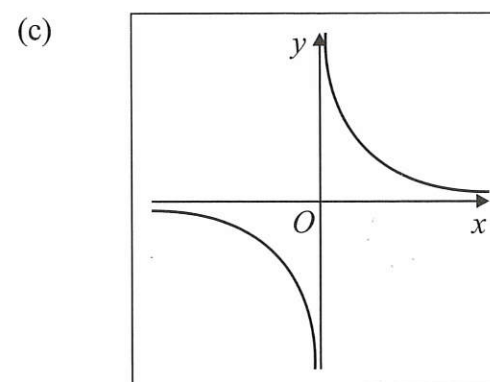
happy face  $\Rightarrow$  positive quadratic

$$y = x^2 \text{ [1]}$$



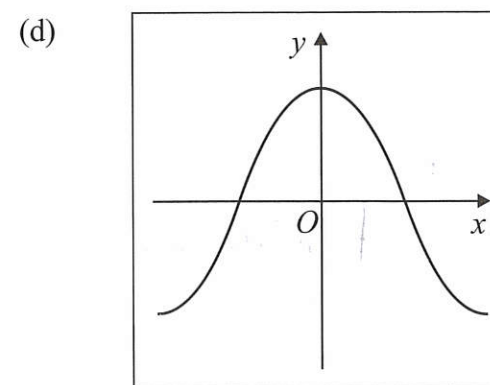
$\rightarrow$  exponential as just going down must be - as all answers - y values

$$y = -2^x \text{ [1]}$$



reciprocal  $\Rightarrow$  1 over no y value when  $x = \phi$

$$y = \frac{1}{x} \text{ [1]}$$



trig function (can't be cubic) as  $y = 1$  when  $x = \phi$  then  $y = \cos x$

$$y = \cos x \text{ [1]}$$

[Total 4 marks]

Leave blank

- 11 A child's set of building blocks contains 5 different colours. One block is selected at random. The table shows the probabilities of selecting a blue block and a green block.

Block Colour	Blue	Green	Orange	Red	Yellow
Probability	0.2	0.35	0.27	0.1	0.08

The probability of picking out a green or orange block is 0.62  
The probability of picking out a block that is not yellow is 0.92

Complete the table to show the probability of picking each block colour.

$$P(O) = 0.62 - 0.35 = 0.27 \text{ (1)}$$

$$P(\text{not yellow}) = 0.92$$

$$P(Y) = 1 - 0.92 = 0.08 \text{ (1)}$$

[Total 3 marks]

- 12 Two numbers are in the ratio 4:5. Their highest common factor is 16.

(a) Find a possible pair of numbers.

$$4 \times 16 = 64$$

$$5 \times 16 = 80$$

1 mark for each correct number

..... 64 ..... and ..... 80 ..... [2]

(b) Are there any other possible pairs? Explain your answer.

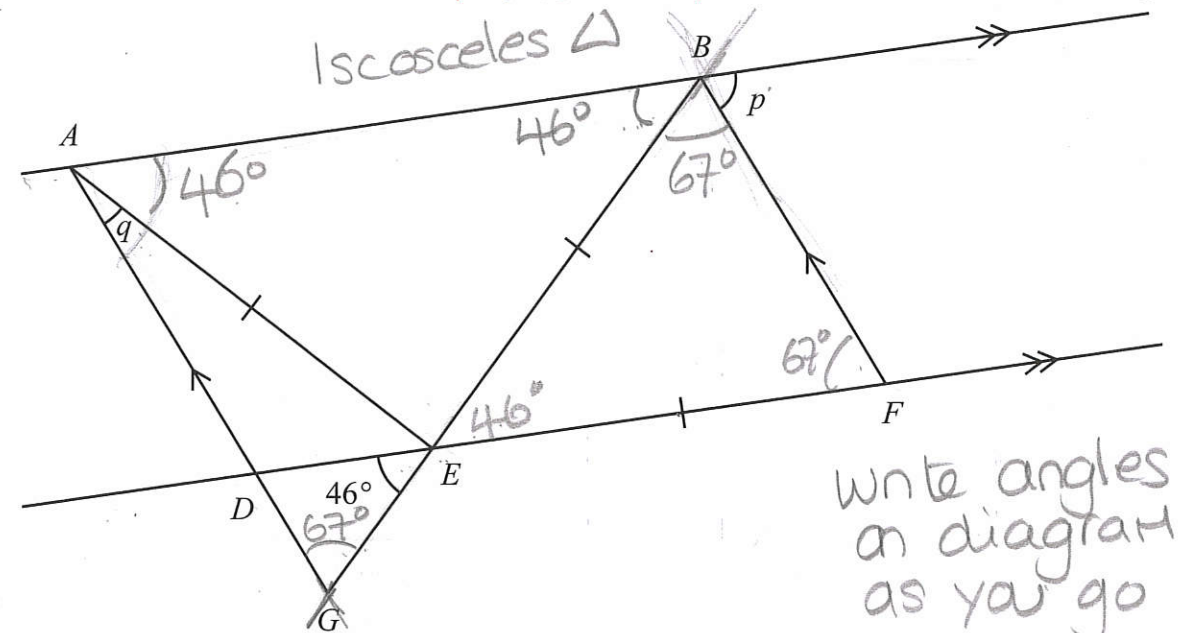
No, multiples of 64 & 80 are also in ratio 4:5 but would have higher factors

[Total 3 marks]

Leave blank

- 13  $ABC$  and  $DEF$  are parallel.  $AG$  and  $BF$  are parallel.  $AE = BE = EF$ . Angle  $DEG = 46^\circ$ .

1 mark for p  
1 mark for correct explanation  
1 mark for q  
1 mark for correct explanation



Find the size of the angles marked  $p$  and  $q$ . You must show your working.

$BEF = 46^\circ \Rightarrow$  opposite angles

$EBF$  &  $BFE$  are equal as isosceles  $\Delta$

$180 - 46 = 134^\circ$  (angles in  $\Delta$  add to  $180^\circ$ )

$134 \div 2 = 67^\circ$

$p = 67^\circ$  (AFB alternate angle)

$AGE = 67^\circ$  (FBE alternate angle)

$180 - (46 + 46 + 67)$

$q = 180 - 159 = 21^\circ$

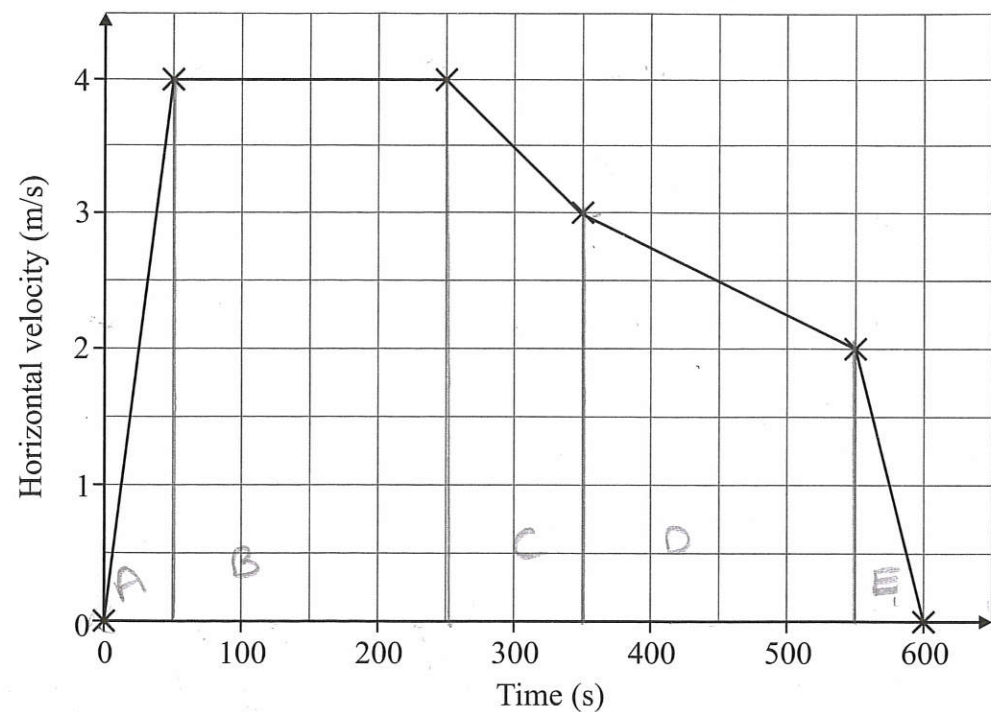
$p = 67^\circ$

$q = 21^\circ$

[Total 4 marks]

Leave blank

- 14 Nuala flew her drone at the beach for 10 minutes. The drone automatically recorded its horizontal velocity and Nuala was able to generate the following graph of the flight.



- (a) Use the graph to work out the total horizontal distance covered by the drone.

$$A = 50 \times 4 \div 2 = 100 \text{ m}$$

$$B = 200 \times 4 = 800 \text{ m}$$

$$C = (3+4) \times 100 \div 2 = 350 \text{ m}$$

$$D = (2+3) \times 200 \div 2 = 500 \text{ m}$$

$$E = 50 \times 2 \div 2 = 50 \text{ m}$$

add them up

$$\begin{array}{r} 100 \\ 800 \\ 350 \\ 500 \\ 50 \\ \hline 1800 \\ \hline 1800 \end{array} \text{ m} \quad [3]$$

- (b) Write down the average horizontal acceleration of the drone.

gradient from (0,0) to (600,0)

$$= 0 \text{ m/s}^2 \quad [1]$$

[Total 4 marks]

1 mark for splitting the graph  
1 mark for correct areas  
1 mark for correct answer

Leave blank

- 15 Find the value of:

- (a)  $\frac{10}{\sqrt{5}}$ , giving your answer in the form  $\sqrt{c}$ , where  $c$  is an integer.

$$\frac{10}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} = \frac{10\sqrt{5}}{5} = 2\sqrt{5} \quad (1)$$

$$\Rightarrow 2 = \sqrt{4} \Rightarrow \sqrt{4} \times \sqrt{5} = \sqrt{20} \quad (1)$$

[3]

- (b)  $(1\frac{7}{9})^{-\frac{1}{2}}$ , giving your answer in the form  $\frac{a}{b}$ , where  $a$  and  $b$  are integers.

make into improper fraction

$$\left(\frac{16}{9}\right)^{-\frac{3}{2}} = \frac{1}{\left(\frac{16}{9}\right)^{\frac{3}{2}}} = \frac{1}{\left(\frac{\sqrt{16}}{\sqrt{9}}\right)^2} = \frac{1}{\left(\frac{4}{3}\right)^2} = \frac{1}{\frac{16}{9}} = \frac{9}{16} \quad (1)$$

[Total 6 marks]

- 16 The table shows a list of metals and their densities (in  $\text{g/cm}^3$ ).

Name of metal	Density ( $\text{g/cm}^3$ )
Aluminium	2.7
Iron	8
Silver	10.5



A metal of volume  $0.5 \text{ m}^3$  has a mass of 4000 kg.

Which metal do you think this is? Show your working.

UNITS

$$1 \text{ m}^3 = 1,000,000 \text{ cm}^3$$

$$0.5 \text{ m}^3 = 500,000 \text{ cm}^3$$

$$4000 \text{ kg} = 4,000,000 \text{ g}$$

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

$$= \frac{4,000,000}{500,000} = \frac{40}{5} = 8 \quad (1)$$

Iron (1)

[Total 2 marks]

Leave blank

- 17 There is a sale on at a clothes shop.  
All shorts are reduced by 10% and all jeans are reduced by 20%.

The ratio of the original price of jeans to the original price of shorts is 7:5.  
The sale price of the shorts is £18.00.

What is the sale price of the jeans?

$$7:5$$

$$18.00 \Rightarrow \text{shorts}$$

$$90\% = \pounds 18$$

$$\therefore 10\% = \pounds 2$$

$$100\% = \pounds 20.00 \quad (1)$$

$$10\% \text{ of } 28 = 2.80$$

$$20\% = 2.80 \times 2 = \pounds 5.60$$

$$28 - 5.60 \quad (1)$$

$$\pounds 22.40 \quad (1)$$

[Total 4 marks]

- 18 Expand and simplify  $(x+3)(x+5)(x-2)$

$$(x+3)(x+5) = x^2 + 3x + 5x + 15$$

$$= x^2 + 8x + 15 \quad (1)$$

$$(x-2)(x^2 + 8x + 15)$$

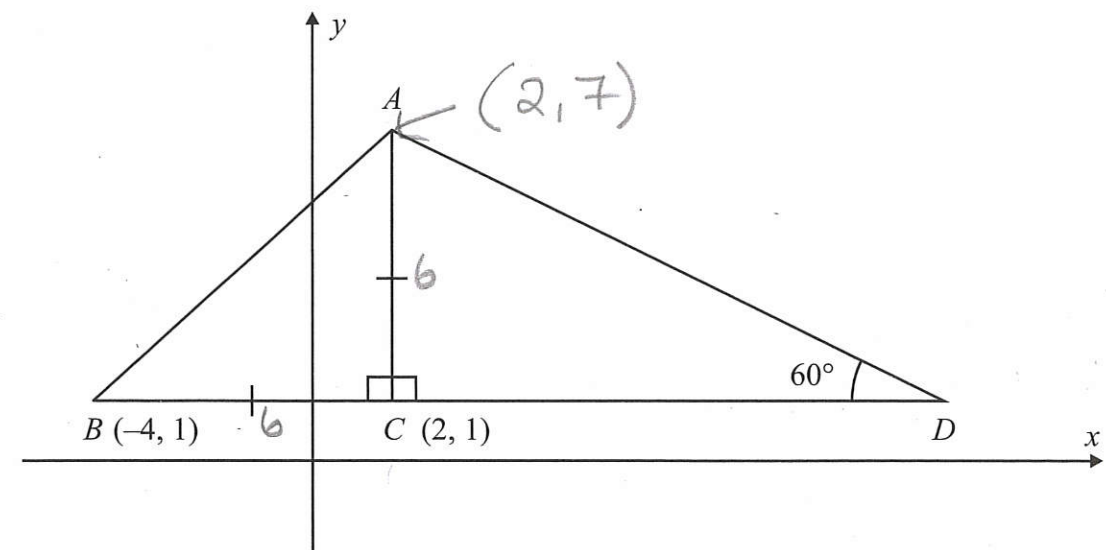
$$x^3 + 8x^2 + 15x - 2x^2 - 16x - 30$$

$$x^3 + 6x^2 - x - 30 \quad (1)$$

[Total 3 marks]

Leave blank

- 19 On a coordinate grid,  $B = (-4, 1)$  and  $C = (2, 1)$ . Triangle  $ABC$  is isosceles. Angle  $ADC = 60^\circ$ .



- (a) Find an expression for the exact length of  $CD$ .  
Give your answer in the form  $a\sqrt{b}$ , where  $a$  and  $b$  are integers.

$$\tan 60 = \frac{6}{CD} \quad (1)$$

$$BC = 2 - (-4) = 6 \quad (1)$$

$$AC = 6 \text{ as isosceles}$$

$$\tan 60 = \sqrt{3}$$

$$\frac{6}{CD} = \sqrt{3} = CD = \frac{6}{\sqrt{3}} \quad (1)$$

$$\frac{6 \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{6\sqrt{3}}{3} =$$

$$CD = 2\sqrt{3} \quad (1)$$

[4]

- (b) Find an expression for the exact length of  $AD$ .  
Give your answer in its simplest form.

$$AD^2 = 6^2 + (2\sqrt{3})^2$$

$$6^2 + 4 \times 3$$

$$AD^2 = 36 + 12 = 48$$

$$AD = \sqrt{48} = \sqrt{16 \times 3} = 4\sqrt{3} \quad (1)$$

$$AD = 4\sqrt{3} \quad (1)$$

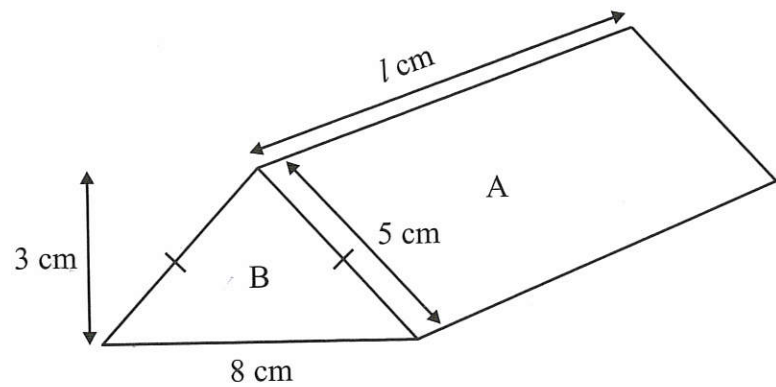
[2]

[Total 6 marks]

Leave blank

20 The triangular prism below has length  $l$  cm.

The ratio of the pressures exerted on the ground when the prism is stood on face A to when it is stood on face B is 3:5.



Find the missing length,  $l$ .

$$\text{Pressure} = \frac{N}{\text{area}}$$

force is the same

$$\text{area of A} = 5 \times l = 5l$$

$$\text{area of B} = 3 \times 8 \div 2 = 12 \text{ cm}^2 \quad (1)$$

Pressure of face A =  $\frac{3}{5}$  of pressure of face B  $(1)$

$\therefore$  area of A must be  $\frac{5}{3}$  x bigger

$$12 \times \frac{5}{3} = 20 \text{ cm}^2 \quad (1)$$

$$\therefore 5l = 20 \quad (1) \quad l = 4 \text{ cm}$$

[Total 4 marks]

Leave blank

21 (a) Solve the simultaneous equations

$$x^2 + y^2 = 20$$

$$x - 3y = 10$$

$$x = 10 + 3y$$

$$(10 + 3y)^2 + y^2 = 20 \quad (1)$$

$$(10 + 3y)(10 + 3y)$$

$$y^2 + 100 + 30y + 30y + 9y^2 = 20$$

$$y^2 + 9y^2 + 60y + 100 = 20$$

$$10y^2 + 60y + 80 = 0 \quad (1)$$

$$\div 10 \quad y^2 + 6y + 8 = 0$$

$$(y + 4)(y + 2) = 0 \quad (1)$$

$$y = -4$$

$$x = 10 + 3(-4) = -2 \quad (1)$$

$$y = -2$$

$$x = 10 + 3(-2) = 4 \quad (1)$$

$$x = -2 \quad y = -4$$

$$x = 4 \quad y = -2$$

[5]

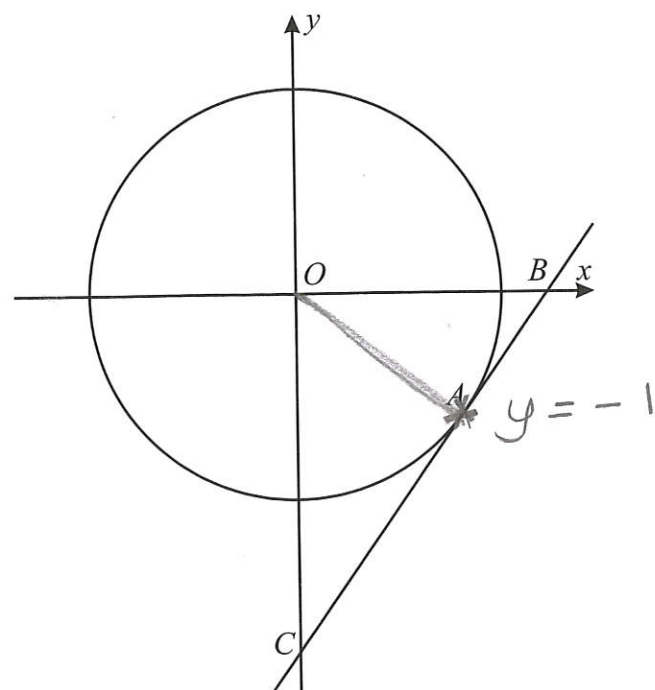
(b) How many points of intersection are there for the graphs with equations  $x^2 + y^2 = 20$  and  $x - 3y = 10$ ? Explain your answer.

The graphs will have 2 points of intersection as they are quadratic simultaneous eq. and have 2 solutions  $(1)$

[Total 6 marks]

Leave blank

- 22 The diagram shows a sketch of the circle with equation  $x^2 + y^2 = 5$ .  
The  $y$ -coordinate of point  $A$  is  $-1$ .  
The tangent to the circle at  $A$  crosses the axes at  $B$  and  $C$  as shown.



Find the area of triangle  $OBC$ .

$x^2 + y^2 = 5$   
 $y = -1$   
 $x^2 + (-1)^2 = 5$   
 $x^2 + 1 = 5$   
 $x^2 = 4$   
 $x = 2$  (1) is positive so  $x = 2$   
 gradient of  $OA = \frac{-1}{2} = -\frac{1}{2}$  (1)  
 gradient of  $CB = 2$  (perpendicular to  $OA$ )  
 $y = 2x + c$  (1)  
 $y = 0$   
 $0 = 2x - 5$   
 $x = 2.5$   
 $c = -5$  (1)  
 $6.25$  (1)

[Total 5 marks]

[TOTAL FOR PAPER = 80 MARKS]

Leave  
blank

General Certificate of Secondary Education

GCSE  
Mathematics (Grade 9-1)  
Higher Tier

Centre name				
Centre number				
Candidate number				

Practice Set 1  
Paper 1: Non-calculator

Time allowed: 1 hour 30 minutes

Surname
Other names
Candidate signature

In addition to this paper you should have:

- A pen, pencil and eraser.
- A ruler.
- A protractor.
- A pair of compasses.

Calculators may **not** be used.



Instructions to candidates

- Write your name and other details in the spaces provided above.
- Answer all questions in the spaces provided.
- In calculations show clearly how you worked out your answers.
- Diagrams are **not** drawn accurately unless otherwise indicated.

Information for candidates

- There are 80 marks available for this paper.
- The marks available are given in brackets at the end of each question.
- You may get marks for method, even if your answer is incorrect.

Advice to candidates

- Work steadily through the paper.
- Don't spend too long on one question.
- If you have time at the end, go back and check your answers.

For examiner's use

Q	Mark	Q	Mark
1		12	
2		13	
3		14	
4		15	
5		16	
6		17	
7		18	
8		19	
9		20	
10		21	
11		22	
<b>Total</b>			



**Answer ALL the questions.**  
**Write your answers in the spaces provided.**  
**You must show all of your working.**

1 **a** and **b** are column vectors such that  $\mathbf{a} = \begin{pmatrix} 8 \\ 3 \end{pmatrix}$  and  $\mathbf{b} = \begin{pmatrix} 1 \\ -7 \end{pmatrix}$ . Calculate:

(a)  $3\mathbf{a}$

.....  
 [1]

(b)  $\mathbf{a} - 4\mathbf{b}$

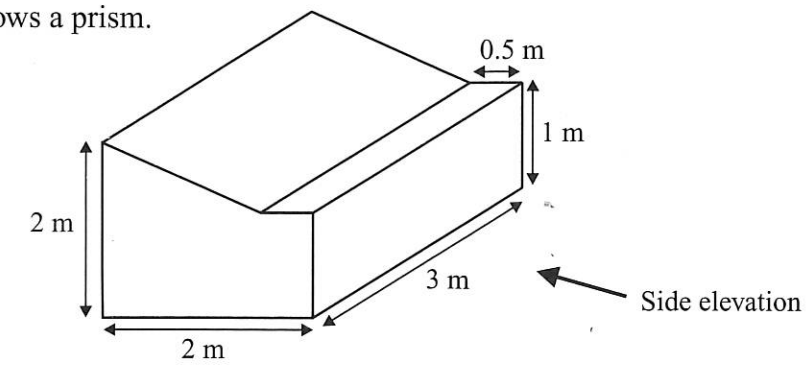
.....  
 [2]  
**[Total 3 marks]**

2 140% of  $x$  is 28.  
 Find the value of  $x$ .

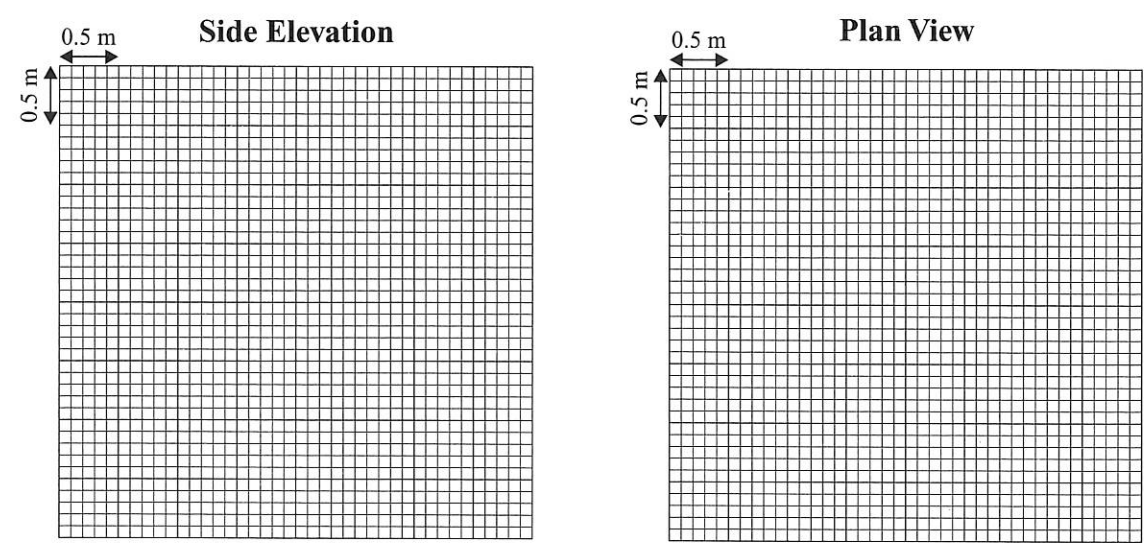
$x =$  .....  
**[Total 2 marks]**

Leave blank

3 The diagram shows a prism.



Using the scale shown on the grids, accurately draw the side elevation and plan view of the prism.



**[Total 2 marks]**

4 (a) Make  $y$  the subject of the formula  $x = 3y - 5$

.....  
 [2]

(b) Factorise the expression  $8x^2 - 12xy$

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 [2]

**[Total 4 marks]**

Leave blank

5 The sets  $\xi$ , P and Q are shown below.

- $\xi = \{\text{positive integers less than or equal to } 20\}$
- $P = \{\text{prime numbers}\}$
- $Q = \{1, 2, 3, 4, 6, 8, 12\}$

(a) List the members of the set  $P \cap Q$

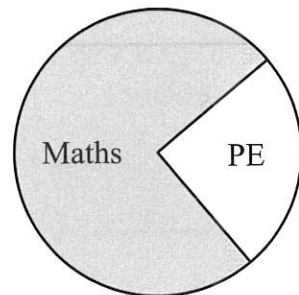
..... [2]

(b) Find  $n(P \cup Q)$

..... [2]

[Total 4 marks]

6 Mathilde asks her group of friends whether they like Maths, PE or History lessons the most. She puts her results in a pie chart.



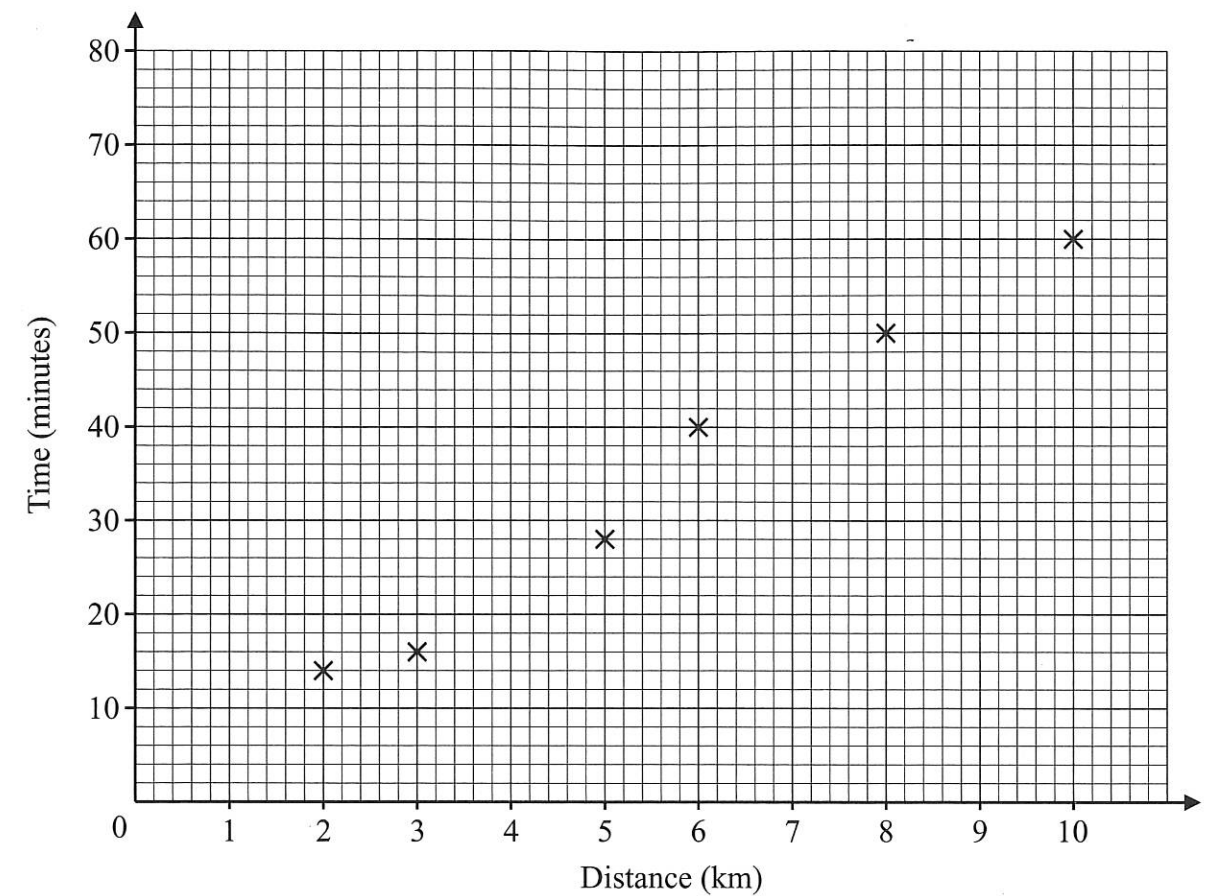
She claims that, "No one in my school likes History the most." Do you agree with her statement? Explain your answer.

.....  
 .....  
 .....

[Total 1 mark]

Leave blank

7 Dom has been training for a half marathon. He records the distances and times taken when he goes out running.



(a) Dom also completed a 4 km run in 21 minutes and a 9 km run in 62 minutes. Plot these points on the graph.

[1]

(b) Use the graph to estimate how long it would take him to run 7.5 km.

..... minutes [2]

(c) Why might you not expect the points to lie in a straight line?

.....  
 .....  
 .....

[1]

[Total 4 marks]

Leave blank

8 Alice has 2 dogs, Ollie and Taffy.  
 Ollie eats  $\frac{2}{3}$  of a tin of dog food every day and Taffy eats  $\frac{2}{5}$  of a tin every day.  
 Alice buys a crate of 24 tins.  
 How many whole days should the crate last?

..... days  
**[Total 3 marks]**

9 Look at this calculation.  

$$\frac{226 \times 0.074}{0.681}$$

(a) By rounding each number to 1 significant figure, work out an estimate to the calculation.

.....  
**[2]**

(b) Explain whether you think your answer to part (a) is an overestimate, underestimate or if it is impossible to tell.

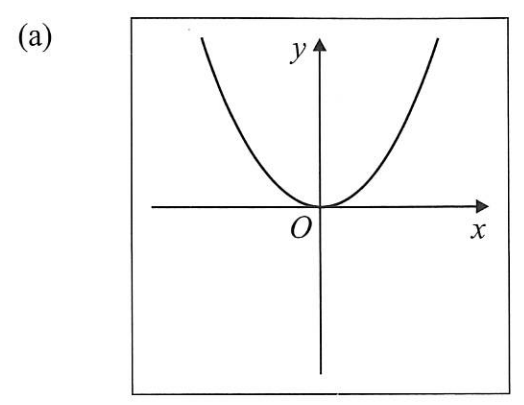
.....  
 .....  
 .....

**[1]**  
**[Total 3 marks]**

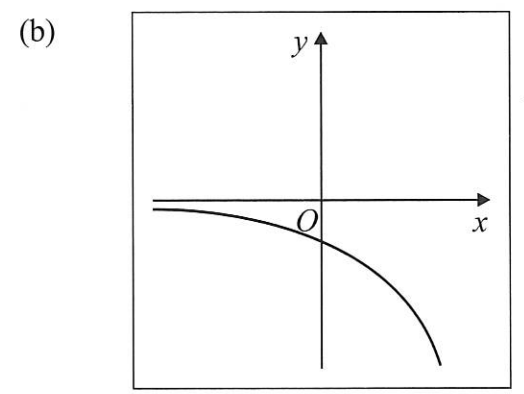
Leave blank

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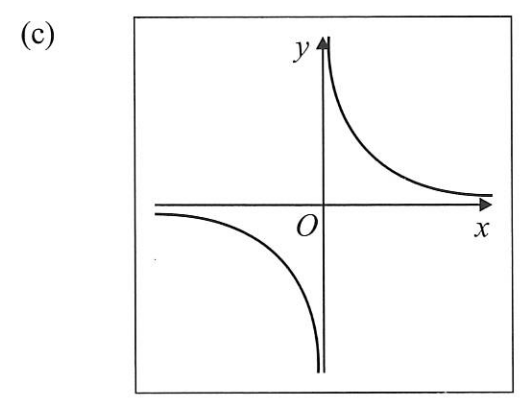
$y = \sin x$	$y = \cos x$	$y = x^2$	$y = -x^2$	$y = x^3$	$y = -x^3$
	$y = -2^x$	$y = 2^x$	$y = \frac{1}{x}$	$y = -\frac{1}{x}$	



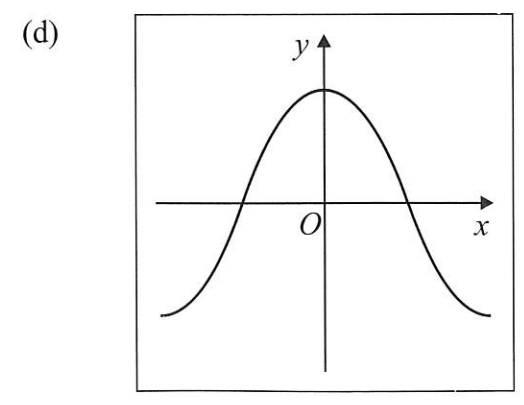
$y = \dots\dots\dots$   
**[1]**



$y = \dots\dots\dots$   
**[1]**



$y = \dots\dots\dots$   
**[1]**



$y = \dots\dots\dots$   
**[1]**

**[Total 4 marks]**

Leave blank

- 11 A child's set of building blocks contains 5 different colours.  
One block is selected at random.  
The table shows the probabilities of selecting a blue block and a green block.

Block Colour	Blue	Green	Orange	Red	Yellow
Probability	0.2	0.35			

The probability of picking out a green or orange block is 0.62  
The probability of picking out a block that is not yellow is 0.92

Complete the table to show the probability of picking each block colour.

[Total 3 marks]

- 12 Two numbers are in the ratio 4:5.  
Their highest common factor is 16.  
(a) Find a possible pair of numbers.

..... and .....  
[2]

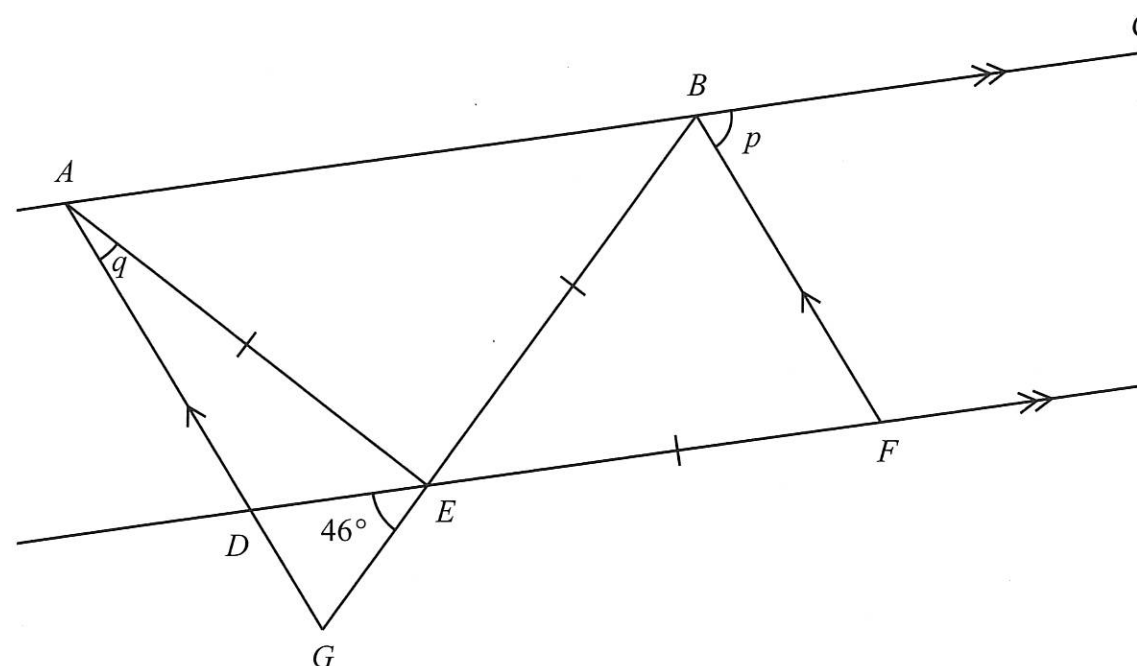
- (b) Are there any other possible pairs? Explain your answer.

.....  
.....  
.....  
[1]

[Total 3 marks]

Leave blank

- 13  $ABC$  and  $DEF$  are parallel.  
 $AG$  and  $BF$  are parallel.  
 $AE = BE = EF$   
Angle  $DEG = 46^\circ$



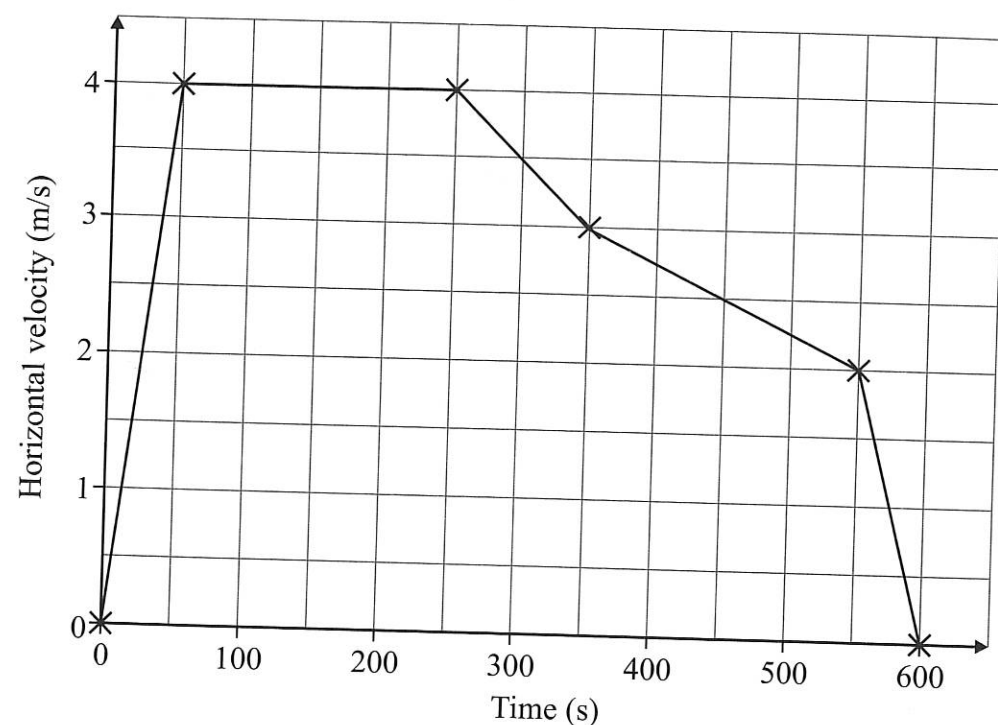
Find the size of the angles marked  $p$  and  $q$ .  
You must show your working.

$p =$  .....  
 $q =$  .....

[Total 4 marks]

Leave blank

- 14 Nuala flew her drone at the beach for 10 minutes. The drone automatically recorded its horizontal velocity and Nuala was able to generate the following graph of the flight.



- (a) Use the graph to work out the total horizontal distance covered by the drone.

..... m  
[3]

- (b) Write down the average horizontal acceleration of the drone.

..... m/s<sup>2</sup>  
[1]

[Total 4 marks]

Leave blank

- 15 Find the value of:

(a)  $\frac{10}{\sqrt{5}}$ , giving your answer in the form  $\sqrt{c}$ , where  $c$  is an integer.

..... [3]

(b)  $\left(1\frac{7}{9}\right)^{-\frac{1}{2}}$ , giving your answer in the form  $\frac{a}{b}$ , where  $a$  and  $b$  are integers.

..... [3]

[Total 6 marks]

- 16 The table shows a list of metals and their densities (in g/cm<sup>3</sup>).

Name of metal	Density (g/cm <sup>3</sup> )
Aluminium	2.7
Iron	8
Silver	10.5

A metal of volume 0.5 m<sup>3</sup> has a mass of 4000 kg.  
Which metal do you think this is? Show your working.

..... [Total 2 marks]

Leave blank

- 17 There is a sale on at a clothes shop.  
 All shorts are reduced by 10% and all jeans are reduced by 20%.  
 The ratio of the original price of jeans to the original price of shorts is 7:5.  
 The sale price of the shorts is £18.00.  
 What is the sale price of the jeans?

£ .....

[Total 4 marks]

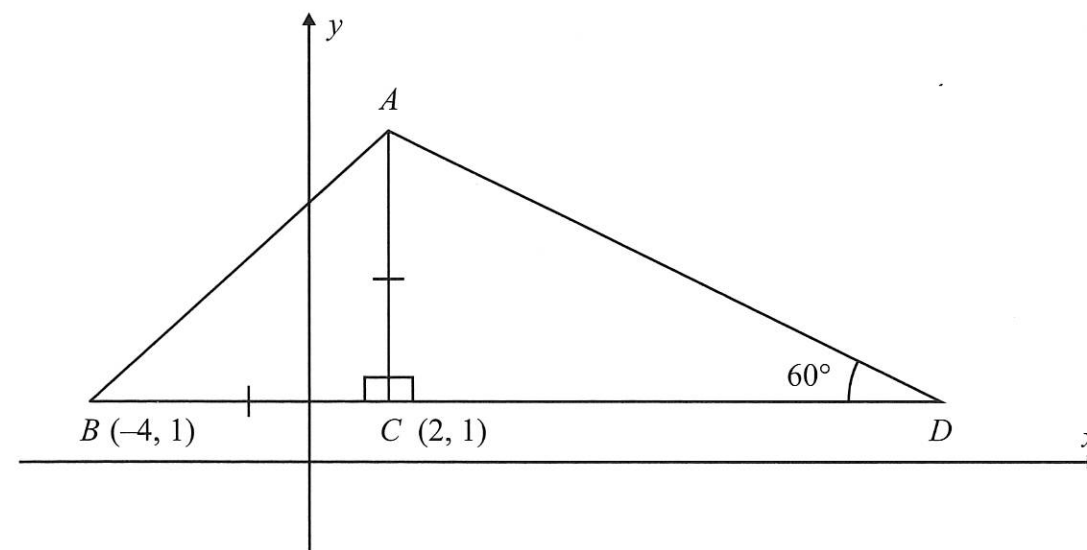
- 18 Expand and simplify  $(x + 3)(x + 5)(x - 2)$

.....

[Total 3 marks]

Leave blank

- 19 On a coordinate grid,  $B = (-4, 1)$  and  $C = (2, 1)$ . Triangle  $ABC$  is isosceles.  
 Angle  $ADC = 60^\circ$ .



- (a) Find an expression for the exact length of  $CD$ .  
 Give your answer in the form  $a\sqrt{b}$ , where  $a$  and  $b$  are integers.

$CD = \dots\dots\dots$  [4]

- (b) Find an expression for the exact length of  $AD$ .  
 Give your answer in its simplest form.

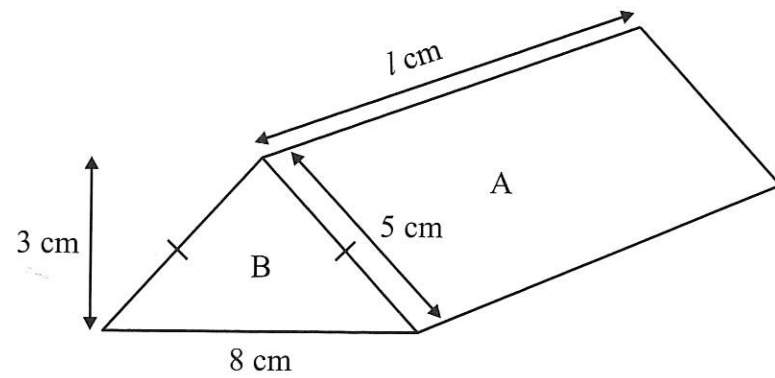
$AD = \dots\dots\dots$  [2]

[Total 6 marks]

Leave blank

20 The triangular prism below has length  $l$  cm.

The ratio of the pressures exerted on the ground when the prism is stood on face A to when it is stood on face B is 3 : 5.



Find the missing length,  $l$ .

$l = \dots\dots\dots$  cm

**[Total 4 marks]**

Leave blank

21 (a) Solve the simultaneous equations

$$x^2 + y^2 = 20$$

$$x - 3y = 10$$

$$x = \dots\dots\dots y = \dots\dots\dots$$

$$x = \dots\dots\dots y = \dots\dots\dots$$

[5]

(b) How many points of intersection are there for the graphs with equations  $x^2 + y^2 = 20$  and  $x - 3y = 10$ ? Explain your answer.

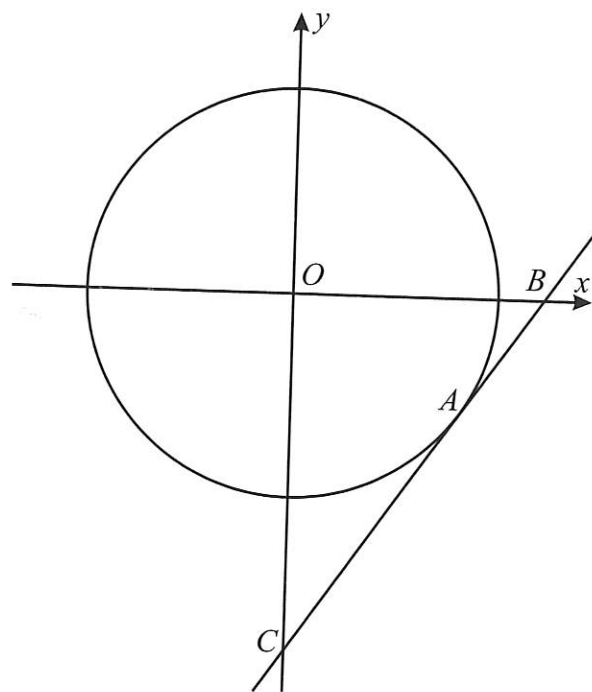
.....  
 .....  
 .....

[1]

**[Total 6 marks]**

Leave blank

- 22 The diagram shows a sketch of the circle with equation  $x^2 + y^2 = 5$ .  
The  $y$ -coordinate of point  $A$  is  $-1$ .  
The tangent to the circle at  $A$  crosses the axes at  $B$  and  $C$  as shown.



Find the area of triangle  $OBC$ .

.....  
[Total 5 marks]

[TOTAL FOR PAPER = 80 MARKS]

Leave  
blank

General Certificate of Secondary Education

GCSE  
Mathematics (Grade 9-1)  
Higher Tier

Centre name				
Centre number				
Candidate number				

Practice Set 1  
Paper 1: Non-calculator

Time allowed: 1 hour 30 minutes

Surname	
Other names	
Candidate signature	

In addition to this paper you should have:

- A pen, pencil and eraser.
- A ruler.
- A protractor.
- A pair of compasses.

Calculators may **not** be used.



Instructions to candidates

- Write your name and other details in the spaces provided above.
- Answer all questions in the spaces provided.
- In calculations show clearly how you worked out your answers.
- Diagrams are **not** drawn accurately unless otherwise indicated.

Information for candidates

- There are 80 marks available for this paper.
- The marks available are given in brackets at the end of each question.
- You may get marks for method, even if your answer is incorrect.

Advice to candidates

- Work steadily through the paper.
- Don't spend too long on one question.
- If you have time at the end, go back and check your answers.

For examiner's use

Q	Mark	Q	Mark
1		12	
2		13	
3		14	
4		15	
5		16	
6		17	
7		18	
8		19	
9		20	
10		21	
11		22	
<b>Total</b>			