

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Here is a list of numbers.

2      4      4      7      8

Work out the range of these numbers.

$$8 - 2 = 6$$

6

(Total for Question 1 is 1 mark)

2 Work out  $120 - 89$

$$\begin{array}{r} 120 \\ - 89 \\ \hline 31 \end{array}$$

31

(Total for Question 2 is 1 mark)

3 Simplify  $3 \times a \times 4$

$$3 \times 4 \times a$$

12a

(Total for Question 3 is 1 mark)

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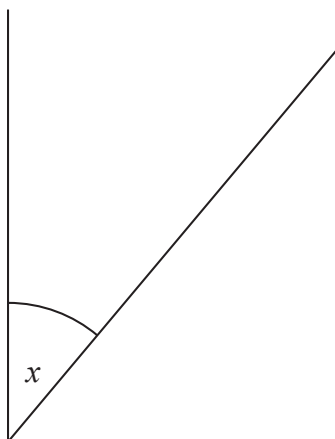


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4 Measure the size of the angle marked  $x$ .



..... 40 °

(Total for Question 4 is 1 mark)

5 Work out  $\frac{1}{5}$  of 300

$$300 \div 5 = 60$$
$$60 \times 1 = 60$$

..... 60

(Total for Question 5 is 1 mark)



- 6 There are 3 litres of oil in a can.  
Jermaine uses 700 millilitres of the oil.

Work out the amount of oil left in the can.  
Give your answer in millilitres.

$$\begin{aligned} 1 \text{ litre} &= 1000 \text{ ml} \\ 3 \text{ litres} &= 3000 \text{ ml} \end{aligned}$$

uses 700 ml.

$$\text{so } 3000 - 700 = 2300$$

.....2300..... millilitres

(Total for Question 6 is 3 marks)

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7 Matt is drawing a scale diagram.

1 cm represents 5 m.

He draws a line 3 cm long.

(a) What real distance does the line represent?

$$\begin{array}{l}
 1 \text{ cm} = 5 \text{ m} \\
 \left. \begin{array}{l} \times 3 \\ \downarrow \end{array} \right\} \quad \left. \begin{array}{l} \times 3 \\ \downarrow \end{array} \right\} \\
 3 \text{ cm} = 15 \text{ m}
 \end{array}$$

.....15.....m  
(1)

The real distance between two points is 20 m.

(b) What is the distance between the two points on the scale diagram?

$$\begin{array}{l}
 1 \text{ cm} = 5 \text{ m} \\
 \left. \begin{array}{l} \times 4 \\ \downarrow \end{array} \right\} \quad \left. \begin{array}{l} \times 4 \\ \downarrow \end{array} \right\} \\
 4 \text{ cm} \quad 20 \text{ m}
 \end{array}$$

.....4.....cm  
(1)

(Total for Question 7 is 2 marks)



P 6 9 5 2 5 A 0 5 2 4

8 Miss Bailey asked 24 students where they each wanted to go on a school trip.

Here are the results.

museum	castle	castle	farm
farm	castle	farm	farm
castle	farm	castle	castle
castle	farm	castle	museum
museum	farm	castle	museum
museum	museum	castle	castle

(a) Complete the frequency table.

Place	Tally	Frequency
castle	1	11
farm		7
museum	1	6

(2)

(b) Write down the place that is the mode.

castle

(1)

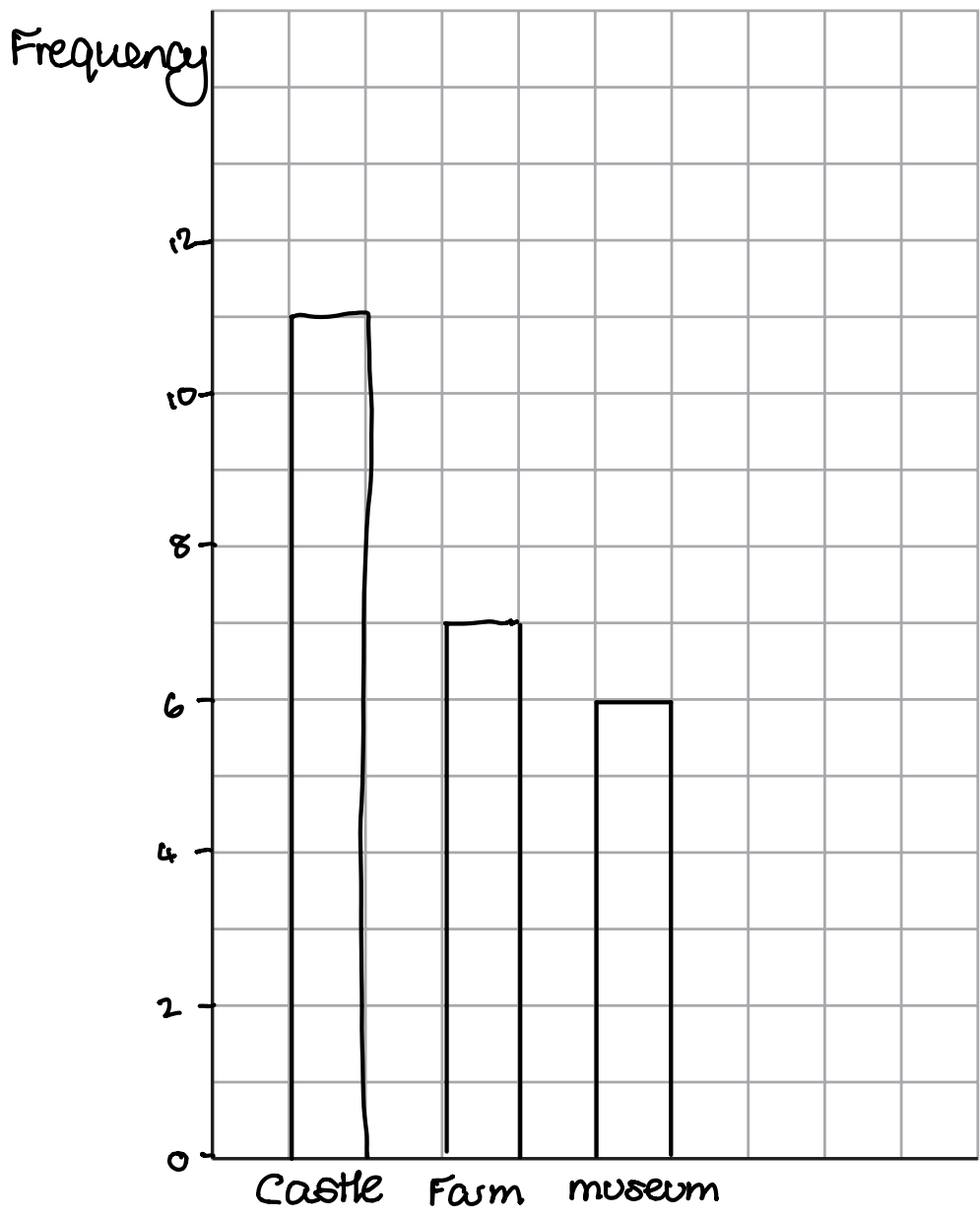


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(c) Draw a bar chart to show the results.



(3)

(Total for Question 8 is 6 marks)



9 Selina has a bag of 22 counters.

5 of the counters are blue.

9 of the counters are red.

8 of the counters are pink.

Selina takes at random a counter from the bag.

Write down the probability that Selina

(i) takes a red counter,

B	R	P	Total
5	9	8	22

$$\frac{9}{22}$$

(1)

(ii) does **not** take a pink counter,

≡

$$22 - 8 = 14$$

$$\frac{14}{22}$$

(1)

(iii) takes a white counter.

$$0$$

(1)

(Total for Question 9 is 3 marks)



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10 Here are the ingredients needed to make 20 peanut butter cookies.

<p>Makes 20 cookies</p> <p>250 g peanut butter</p> <p>200 g sugar</p> <p>2 small eggs</p>
---

Derek wants to make 60 cookies.

He has 900 g of peanut butter.

Does Derek have enough peanut butter to make 60 cookies?

You must show how you get your answer.

$$250g = 20 \text{ cookies}$$

$$\times 3 \qquad \qquad \times 3$$

$$750g = 60 \text{ cookies}$$

$$\begin{array}{r} 250 \\ \times 3 \\ \hline 750 \end{array}$$

Yes, they have enough

$$750g < 900g$$

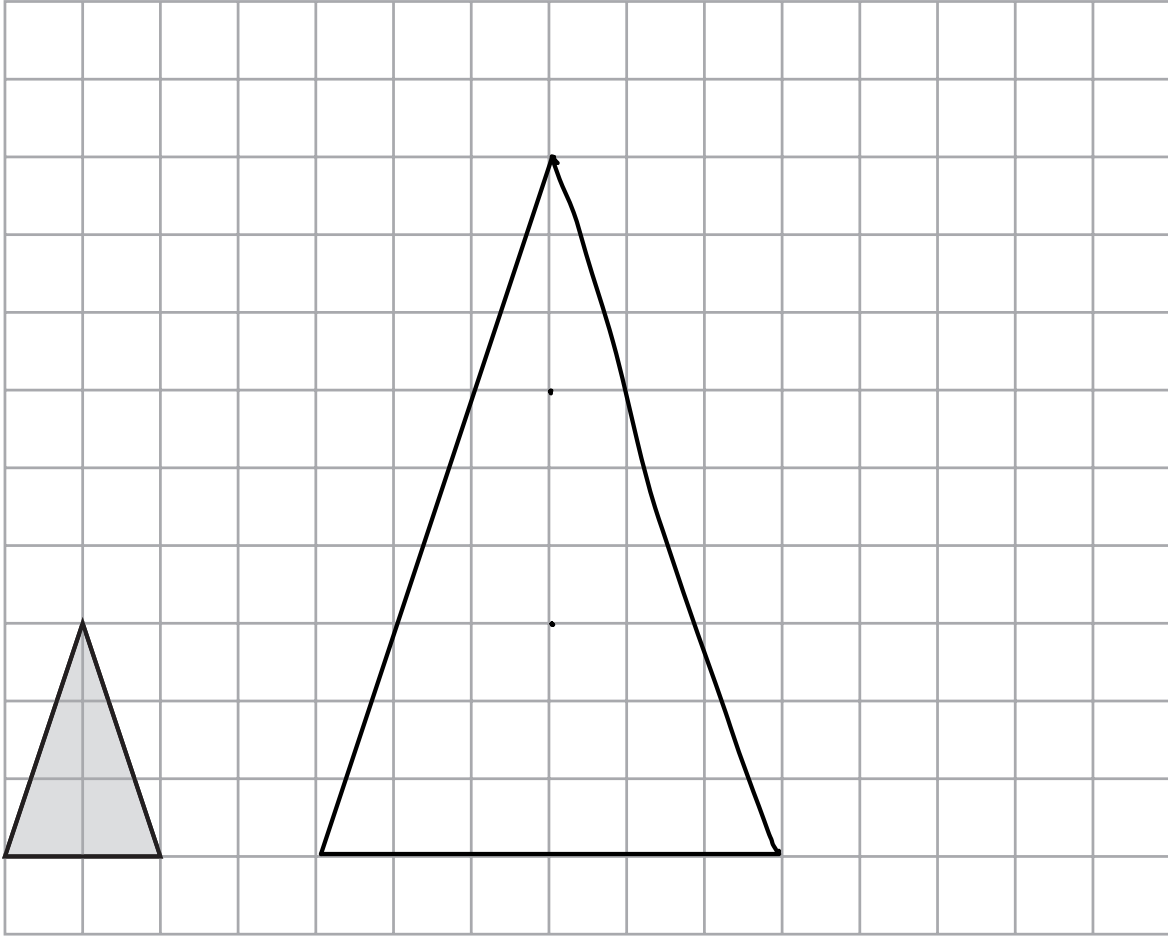
(Total for Question 10 is 3 marks)



P 6 9 5 2 5 A 0 9 2 4



11



On the grid, draw an enlargement of the triangle with a scale factor of 3

(Total for Question 11 is 2 marks)

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12  $P = 2g + 4h$

(a) (i) Work out the value of  $P$  when  $g = 3$  and  $h = 5$

$$\begin{aligned} P &= 2 \times 3 + 4 \times 5 \\ &= 6 + 20 \\ &= 26 \end{aligned}$$

$$P = \underline{26} \quad (2)$$

(ii) Work out the value of  $g$  when  $P = 38$  and  $h = 3$

$$\begin{aligned} 38 &= 2g + 4 \times 3 \\ 38 &= 2g + 12 \\ -12 & \quad -12 \\ 26 &= 2g \\ \text{so } g &= \frac{26}{2} = 13 \end{aligned}$$

$$g = \underline{13} \quad (2)$$

$V = 3r - q$

(b) Work out the value of  $V$  when  $r = -3$  and  $q = 2$

$$\begin{aligned} V &= 3 \times -3 - 2 \\ &= -9 - 2 \\ &= -11 \end{aligned}$$

$$V = \underline{-11} \quad (2)$$

(Total for Question 12 is 6 marks)

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## 13 Chloe is making scrunchies.

Chloe has a large number of hair bands.  
Each hair band costs 8p.

She buys 100g of wool for £3

Chloe uses 1 hair band and 5g of wool to make each scrunchy.  
She makes as many scrunchies as she can.

Work out the total cost of each scrunchy that she makes.  
Give your answer in pence.

1 hair band + 5g wool = 1 scrunchy.

8p

100g = £3

100g = 300

÷ 20

÷ 20

5g = 15p

Total  
= 8p + 15p  
= 23p

$$20 \overline{) 300} \begin{array}{r} 015 \\ \underline{300} \\ 00 \end{array}$$

23

.....p

(Total for Question 13 is 4 marks)



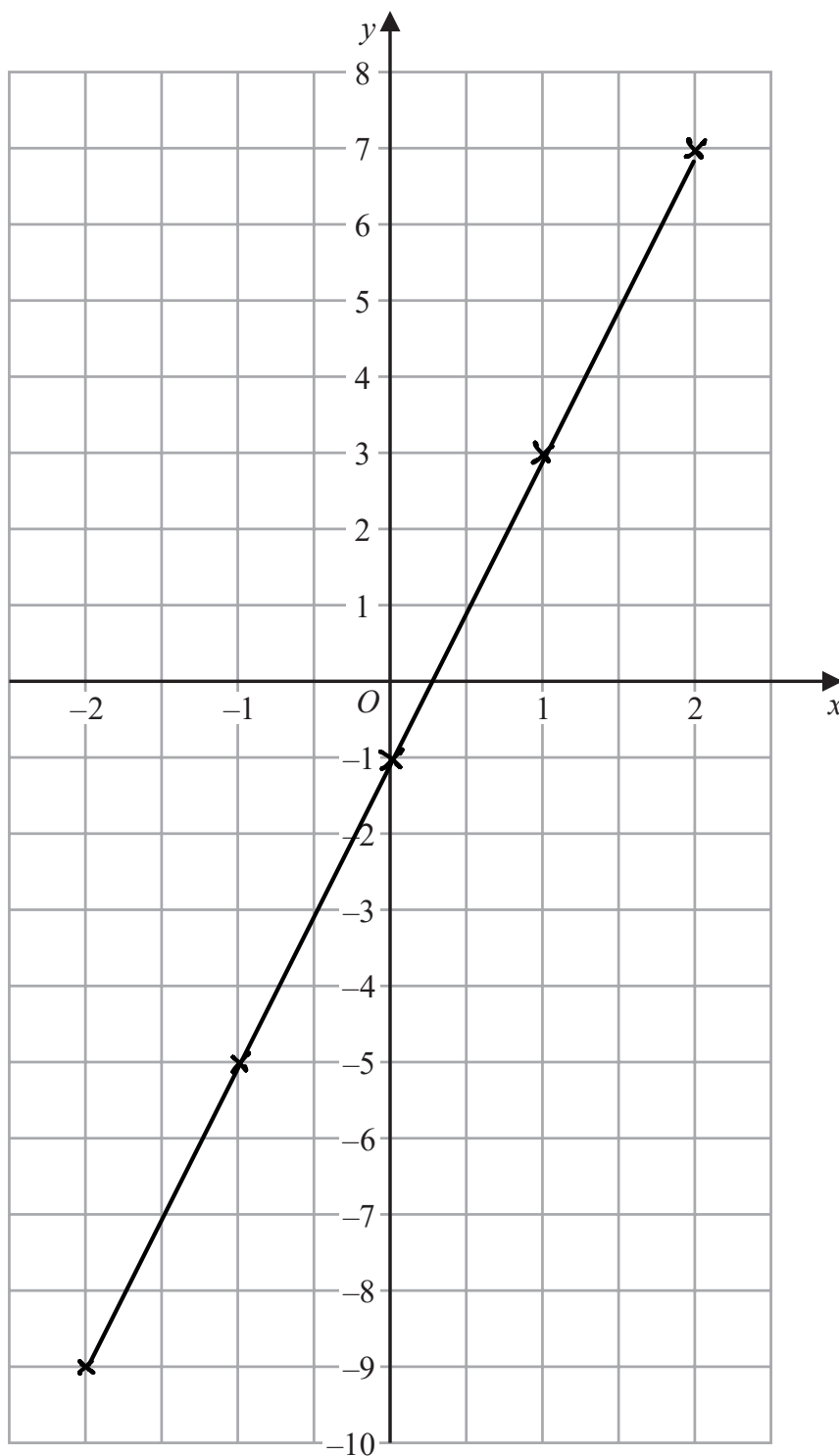
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14 On the grid, draw the graph of  $y = 4x - 1$  for values of  $x$  from  $-2$  to  $2$

$x$	$-2$	$-1$	$0$	$1$	$2$
$y$	$-9$	$-5$	$4 \times 0 - 1$ $= -1$	$4 \times 1 - 1$ $= 3$	$4 \times 2 - 1$ $= 7$



(Total for Question 14 is 3 marks)



P 6 9 5 2 5 A 0 1 3 2 4

- 15 Steve is buying a car.  
The car costs £12 000

Steve pays 25% of the cost as a deposit.  
He pays the rest of the cost in 20 equal monthly payments.

How much is each monthly payment?

$$\text{Total} = 12000$$

$$\begin{aligned} \text{Deposit} &= 25\% && 25\% \text{ of } 12000 \\ & && 50\% = 6000 \\ & && \text{so } 25\% = 3000 \end{aligned}$$

$$\text{THE REST} = 12000 - 3000 = 9000$$

$$9000 \div 20 = 450$$

$$20 \overline{) 9000} \begin{array}{r} 0450 \\ \underline{9000} \\ 0 \end{array}$$

£ 450

(Total for Question 15 is 4 marks)

- 16 Shah takes an exam.  
The exam is out of 60 marks.

Shah needs to score at least 70% of the marks to pass the exam.  
He scores 45 marks.

Show that Shah passes the exam.

$$\begin{aligned} \text{needs } 70\% \text{ of } 60 \text{ marks} & \quad 10\% = 6 \text{ so } 70\% = 6 \times 7 \\ & = \underline{\underline{42}} \end{aligned}$$

$$\text{actually scores } 45$$

$$45 > 42 \text{ so Shah passes the exam}$$

(Total for Question 16 is 2 marks)



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17 Work out  $\frac{3}{5} \div \frac{1}{6}$

Give your answer as a mixed number.

$$\frac{3}{5} \times \frac{6}{1} = \frac{18}{5}$$

5  
10  
15

$$\frac{18}{5} = 3\frac{3}{5}$$

$3\frac{3}{5}$

(Total for Question 17 is 3 marks)

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18 Work out  $6.3 \times 2.4$

	60	3	
20	1200	60	
4	240	12	

$$\begin{array}{r}
 1200 \\
 240 \\
 60 \\
 12 \\
 \hline
 1512
 \end{array}$$

so  $63 \times 24 = 1512$

$$6.3 \times 2.4 = 15.12$$

$15.12$

(Total for Question 18 is 3 marks)

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19 (a) (i) Write down the value of  $5^0$

1  
(1)

(ii) Write down the value of  $5^{-2}$

$$\frac{1}{5^2} = \frac{1}{25}$$

$\frac{1}{25}$   
(1)

(b) Write  $\frac{2^5 \times 2^4}{2^3}$  in the form  $2^n$  where  $n$  is an integer.

$$2^5 \times 2^4 = 2^9$$

$$\frac{2^9}{2^3} = 2^6$$

$2^6$   
(2)

(Total for Question 19 is 4 marks)

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20 (a) Write 156 as a product of its prime factors.

$$\begin{array}{r}
 1 \\
 \hline
 13 \overline{) 156} \\
 \underline{39} \\
 2 \overline{) 78} \\
 \underline{78} \\
 2 \overline{) 156}
 \end{array}$$

so  $156 = 2 \times 2 \times 3 \times 13$

$$2^2 \times 3 \times 13$$

(2)

(b) Find the highest common factor (HCF) of 156 and 130

$$\begin{aligned}
 130 &= 13 \times 10 \\
 &= 13 \times 2 \times 5
 \end{aligned}$$

$$\begin{aligned}
 156 &= \boxed{2} \times 2 \times 3 \times \boxed{13} \\
 130 &= \boxed{2} \quad \quad \quad \times 5 \times \boxed{13}
 \end{aligned}$$

$$\begin{aligned}
 \text{HCF} &= 2 \times 13 \\
 &= 26
 \end{aligned}$$

$$26$$

(2)

(Total for Question 20 is 4 marks)



P 6 9 5 2 5 A 0 1 7 2 4



21 The mean length of 5 sticks is 4.2 cm.

Nawal measured the length of one of the sticks as 7 cm.

(a) Work out the mean length of the other 4 sticks.

$$5 \text{ sticks} \rightarrow \text{mean} = 4.2 \quad \text{Total length} = \begin{array}{r} 4.2 \\ \times 5 \\ \hline 21.0 \end{array} = 21 \text{ cm}$$

$$1 \text{ stick} = 7 \text{ cm so total of 4 sticks} \\ = 21 - 7 = 14 \text{ cm}$$

$$14 \div 4 = 4 \overline{) 14.20} \\ \begin{array}{r} 03.5 \\ \underline{4 \phantom{0} 14} \\ 20 \\ \underline{4 \phantom{0} 20} \\ 0 \end{array} = 3.5$$

$$\dots\dots\dots 3.5 \dots\dots\dots \text{cm} \\ (3)$$

Nawal made a mistake.  
The stick was not 7 cm long.  
It was 17 cm long.

(b) How does this affect your answer to part (a)?

my answer would be smaller than 3.5; it would  
( $21 - 17 = 4 \text{ cm}$   $4 \div 4 = 1$ ) be 1 cm

(1)

(Total for Question 21 is 4 marks)

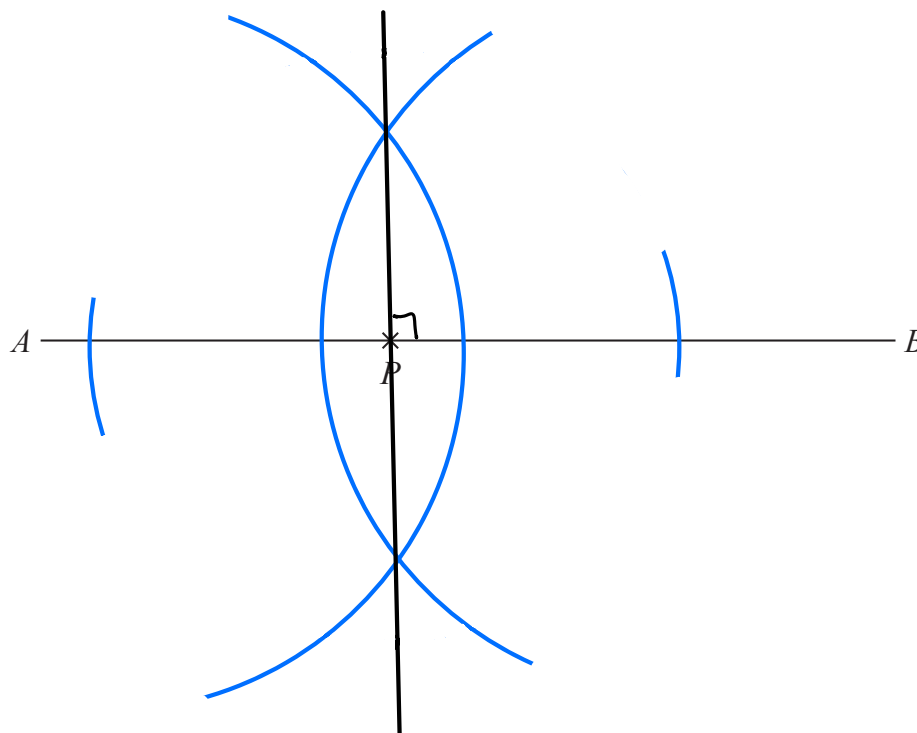


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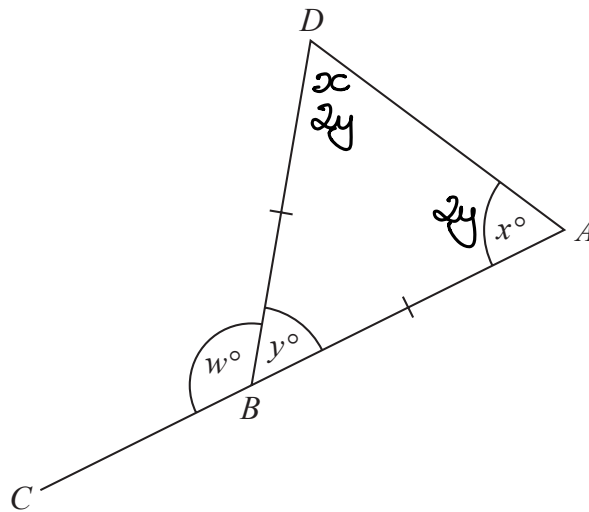
- 22 The point  $P$  lies on the line  $AB$ .  
Use ruler and compasses to construct an angle of  $90^\circ$  at  $P$ .  
You must show all your construction lines.



(Total for Question 22 is 2 marks)



23 The diagram shows an isosceles triangle  $ABD$  and the straight line  $ABC$ .



$BA = BD$

$x : y = 2 : 1$

Work out the value of  $w$ .

$x : y$

$2 : 1$

so  $x = 2y$

$5y = 180$

$y = 180 \div 5$

$y = 36$

$$\begin{array}{r} 36 \\ 5 \overline{) 180} \\ \underline{15} \phantom{0} \\ 30 \\ \underline{30} \\ 0 \end{array}$$

so  $w = 180 - 36$   
 $= 144$

$w = \dots 144 \dots$

(Total for Question 23 is 4 marks)

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24 Mano has three shelves of books.

There are  $x$  books on shelf A.

There are  $(3x + 1)$  books on shelf B.

There are  $(2x - 5)$  books on shelf C.

There is a total of 44 books on the three shelves.

All the books have the same mass.

The books on shelf B have a total mass of 7500g.

Work out the total mass of the books on shelf A.

A	B	C	
$x$	$3x + 1$	$2x - 5$	$= 44$

$$6x - 4 = 44$$

$$6x = 48$$

$$x = 8 \text{ books}$$

A	B	C
8	$3 \times 8 + 1$ $= 25$	$2 \times 8 - 5$ $= 11$

$$7500g$$

$$7500 \div 25$$

$$\begin{array}{r}
 300 \\
 25 \overline{) 7500} \\
 \underline{7500} \\
 0
 \end{array}$$

$$\text{each book} = 300g$$

shelf B

$$8 \times 300$$

$$= 2400g$$

..... 2400 ..... g

(Total for Question 24 is 5 marks)



25 A piece of glass has a mass of 27 g and a volume of 10 cm<sup>3</sup>

Work out the density of the piece of glass.

$$D = \frac{27}{10}$$



..... 2.7 ..... g/cm<sup>3</sup>

(Total for Question 25 is 2 marks)

26 Work out an estimate for  $\frac{5.7 \times 8.2}{0.26}$

$$\frac{6 \times 8}{0.25} = \frac{48}{0.25}$$

$$48 \div \frac{1}{4} = 48 \times \frac{4}{1}$$

$$\begin{array}{r} 48 \\ \times 4 \\ \hline 192 \\ 3 \end{array}$$

$$= 192$$

..... 192 .....

(Total for Question 26 is 3 marks)



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

$3x \times 2x$   
 $3x \times -5$   
 $2 \times 2x$   
 $2 \times -5$

$$6x^2 - 15x + 4x - 10$$

$$\underline{6x^2 - 11x - 10}$$

(2)

(b) Factorise  $x^2 - 16$

$$(x + 4)(x - 4)$$

$$\underline{(x + 4)(x - 4)}$$

(1)

(Total for Question 27 is 3 marks)

**TOTAL FOR PAPER IS 80 MARKS**

