



MATHS GENIE REVISION BOOKLET

Grade 4

Name:.....

Class/Teacher:.....

All answers can be found on Maths Genie
website, in GCSE revision section:

www.mathsgenie.co.uk

- 4.1 Compound Interest and Depreciation
- 4.2 Indices
- 4.3 Prime Factors, HCF and LCM
- 4.4 Real Life and Distance Time Graphs
- 4.5 Inequalities
- 4.6 Forming and Solving Equations
- 4.7 Sequences (Nth Term)
- 4.8 Expanding and Factorising
- 4.9 Pythagoras
- 4.10 Angles in Parallel Lines
- 4.11 Angles in Polygons
- 4.12 Surface Area
- 4.13 Volume of a Prism
- 4.14 Cylinders
- 4.15 Loci and Construction
- 4.16 Bearings
- 4.17 Plans and Elevations
- 4.18 Averages from Frequency Tables
- 4.19 Probability
- 4.20 Scatter Graphs

Click on the links below for the taught videos to help you with the topics in this booklet

4.1 Compound Interest and Depreciation

<https://www.mathsgenie.co.uk/compound-interest.php>

4.2 Indices

<https://www.mathsgenie.co.uk/indices.php>

4.3 Prime Factors, HCF and LCM

https://www.mathsgenie.co.uk/HCF_LCM.php

4.4 Real Life and Distance Time Graphs

<https://www.mathsgenie.co.uk/real-graphs.php>

4.5 Inequalities

<https://www.mathsgenie.co.uk/inequalities.php>

4.6 Forming and Solving Equations

<https://www.mathsgenie.co.uk/forming-and-solving-equations.php>

4.7 Sequences (nth term)

<https://www.mathsgenie.co.uk/sequences.php>

4.8 Expanding and Factorising

<https://www.mathsgenie.co.uk/expanding-and-factorising.php>

4.9 Pythagoras

<https://www.mathsgenie.co.uk/pythagoras.php>

4.10 Angles in Parallel Lines

<https://www.mathsgenie.co.uk/angles-parallel.php>

4.11 Angles in Polygons

<https://www.mathsgenie.co.uk/angles-polygons.php>

4.12 Surface Area

<https://www.mathsgenie.co.uk/surfacearea.php>

4.13 Volume of a Prism

<https://www.mathsgenie.co.uk/volume.php>

4.14 Cylinders

<https://www.mathsgenie.co.uk/cylinders.php>

4.15 Loci and Constructions

<https://www.mathsgenie.co.uk/loci-and-construction.php>

4.16 Bearings

<https://www.mathsgenie.co.uk/bearings.php>

4.17 Plans and Elevations

<https://www.mathsgenie.co.uk/plans-and-elevations.php>

4.18 Averages from Frequency Tables

<https://www.mathsgenie.co.uk/mean-tables.php>

4.19 Probability

<https://www.mathsgenie.co.uk/probability2.php>

4.20 Scatter Graphs

<https://www.mathsgenie.co.uk/scatter-graphs.php>

Remember to show your teacher the work that you've completed and to ask in lessons for any help with these topics.

- 1 Jesy invests £8000 for n years in a savings account.

To find the value, V , of her investment after n years she uses the formula:

$$V = 8000 \times (1.025)^n$$

- (a) Write down the annual rate of interest Jesy earns.
- (b) Find the **total amount of interest** Jesy earns in three years.

(Total for question 1 is 3 marks)

- 2 Perrie invests £25000 for 3 years in a savings account.
She gets 2.7% per annum compound interest.

Calculate the **total amount of interest** Perrie will get after 3 years.

(Total for question 2 is 3 marks)

- 3 Jade bought a house for £350 000.

In the first year the house price increased by 3%
In the second year the house price increased by 2%
In the third year the house price depreciated by 5%

Work out the value of the house at the end of 3 years.

(Total for question 3 is 3 marks)

- 4 Leigh-Anne invests £2500 for 4 years in a savings account.
She gets 3% per annum compound interest.

How much money does Leigh-Anne have at the end of 4 years.

(Total for question 4 is 2 marks)

- 5 Annie invests £9500 for 5 years in a savings account.
She gets 1.8% per annum compound interest.

How much money does Annie have at the end of 5 years.

(Total for question 5 is 2 marks)

- 6 Greg bought a new car for £18 000.
In the first year the value of the car depreciates by 30%.
In the second year and the third year the car depreciates by 14%

Work out the value of the car after three years.

(Total for question 6 is 3 marks)

- 7 Nick bought a new car.
Each year the car depreciates in value by 12%.

Work out the number of years it takes for the car to half in value.

(Total for question 7 is 3 marks)

- 8 Fearne invests £5600 in a savings account.
She gets 2% per annum compound interest.

After n years, Fearne has £6061.62 in her account.
Work out the value of n .

(Total for question 8 is 2 marks)

9 Alice is going to invest some money for 5 years.

She can choose from two options:

Investment A: 2.7% compound interest per annum

Investment B: 2.8% simple interest per annum

Which investment should Alice choose

You must show your working.

(Total for question 9 is 4 marks)

10 Matt wants to invest £8000 for three years. He can choose between Bank A and Bank B.

Bank A

1.2% compound interest
per annum

Bank B

2% compound interest in
the first year
1% compound interest
for each extra year

Which bank will give Matt the most interest after three years.

You must show your working.

(Total for question 10 is 4 marks)

11 Melvin invests £5000 in an account paying 2.5% compound interest per annum.

Charlie invests £4500 in an account paying 3% compound interest per annum.

Work out the difference between the amount of money Melvin has after 5 years and the amount of money Charlie has after 5 years.

(Total for question 11 is 4 marks)

Workings Out Page

- 1 (a) Simplify $x^8 \times x^3$ (1)
 (b) Simplify $(5y)^3$ (1)
 (c) Simplify $\frac{w^7}{w^4}$ (1)
(3 marks)

- 2 (a) Simplify $a^9 \times a^4$ (1)
 (b) Simplify $(4b^2c)^3$ (1)
 (c) Simplify $d^9 \div d^4$ (1)
(3 marks)

- 3 (a) Simplify $2m^2 \times 5n^6$ (1)
 (b) Simplify $15p^3 \div 3p^4$ (2)
(3 marks)

- 4 (a) Simplify $(t^3)^4$ (1)
 (b) Simplify $12m^2n^6 \div 3mn^4$ (2)
(3 marks)

- 5 Simplify $5m^2n^3 \times 3mn^4$ (2 marks)

- 6 (a) Write down the value of 5^{-3} (1)
 (b) Write down the value of 5^0 (1)
(2 marks)

- 7 Work out the value of $5^2 \times 2^3$ (1 mark)

- 8 Write down the value of 2^{-3} (1 mark)

- 9 $y^2 \times y^a = y^7$
 (a) Find the value of a . (1)
 $(y^4)^b = y^{12}$
 (b) Find the value of b . (1)
(2 marks)

- 10 (a) Given $\frac{x^6}{x^a} = x^8$ (1)
 Find the value of a .
 (b) Simplify $(2m^2)^4$ (2)
(3 marks)

- 11 (a) Write $\frac{3^4 \times 3^5}{3^2}$ as a power of 3 (2)
 (b) Write down the value of 3^{-3} (1)
 (c) Write down the value of 3^0 (1)
(4 marks)

12 Work out the value of $\frac{2^9 \times 2^{-2}}{2^4}$

(2 marks)

13 Work out the value of $(2^2)^3$

(1 marks)

14 (a) Simplify $p^3 \times p^5$ (1)

(b) Simplify $(4ab^2)^3$ (2)

(c) Simplify $\frac{16m^7n^3}{4m^3n}$ (2)

(5 marks)

15 $1000^4 = 10^x$

Find the value of x .

(1 mark)

16 Work out the value of $\frac{2^3 \times 2}{2^5}$

(2 marks)

17 Write down the reciprocal of 8

(1 mark)

18 (a) Simplify $9p^3 \times 2p^{-2}$ (1)

(b) Simplify $(5x^3y^2)^3$ (2)

(c) $p^3 \times p^5 = p^{12} \times p^y$

Find the value of y (2)

(5 marks)

19 $10^x = 1$

Write down the value of x .

(1 mark)

20 Write $5^4 \times 5$ as a power of 5

(1 mark)

21 Write down the reciprocal of 2

(1 mark)

22 (a) Simplify $5c^2d^3 \times 2d$ (1)

(b) Write 64×4^5 as a power of 4 (2)

(c) Simplify $p^3 \times (p^5)^2$ (2)

(5 marks)

23 $p^9 \times p^5 = p^x$

Write down the value of x

(1 mark)

24 Write down the reciprocal of $\frac{1}{3}$

(1 mark)

25 Simplify $\frac{10p^3q^5r}{4p^3q^6}$

(2 marks)

Workings Out Page

1 Write 40 as a product of its prime factors.

(2 marks)

2 Write 72 as a product of its prime factors.

(2 marks)

3 Write 98 as a product of its prime factors.

(2 marks)

4 Write 240 as a product of its prime factors.

(2 marks)

5 Find the highest common factor (HCF) of 60 and 114

(3 marks)

6 Find the lowest common multiple (LCM) of 120 and 150

(3 marks)

7 Find the highest common factor (HCF) of 84 and 120

(3 marks)

8 Find the lowest common multiple (LCM) of 70 and 56

(3 marks)

9 Two buses, bus A and bus B, both use the same bus stop.

Bus A runs every 10 minutes.

Bus B runs every 14 minutes.

Both buses are at the bus stop at 11 am.

What time will both buses next both be at the bus stop.

(3 marks)

10 Light A flashes every 8 seconds.

Light B flashes every 20 seconds.

Both lights flash at the same time.

Work out how long it will take for both lights to flash at the same time again.

(3 marks)

11 $648 = 2^3 \times 3^4$ $540 = 2^2 \times 3^3 \times 5$

(a) Write down the highest common factor (HCF) of 648 and 540.

(b) Find the lowest common multiple (LCM) of 648 and 540.

(3 marks)

12 $A = 2^2 \times 3 \times 5^2$ $B = 2^3 \times 3^2 \times 7$

(a) Write down the highest common factor (HCF) of A and B.

(b) Find the lowest common multiple (LCM) of A and B.

(3 marks)

13 Find the lowest common multiple (LCM) of 12, 15 and 18.

(3 marks)

14 Light A flashes every 5 seconds.
Light B flashes every 6 seconds.
Light C flashes every 7 seconds.

All three lights flash at the same time.

Work out how long it will take for all three lights to flash at the same time again.

(3 marks)

15 Find the highest common factor (HCF) of 72, 90 and 126

(3 marks)

16 Kenny is thinking of two numbers **greater than 10**.

He says:

"The highest common factor (HCF) of my two numbers is 7

The lowest common multiple (LCM) of my two numbers is 84"

Write down the two numbers that Kenny is thinking of.

(3 marks)

Workings Out Page

Workings Out Page

Name: _____

GCSE (1 – 9)

Real Life Graphs

Instructions

- Use **black** ink or ball-point pen.
- Answer all questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

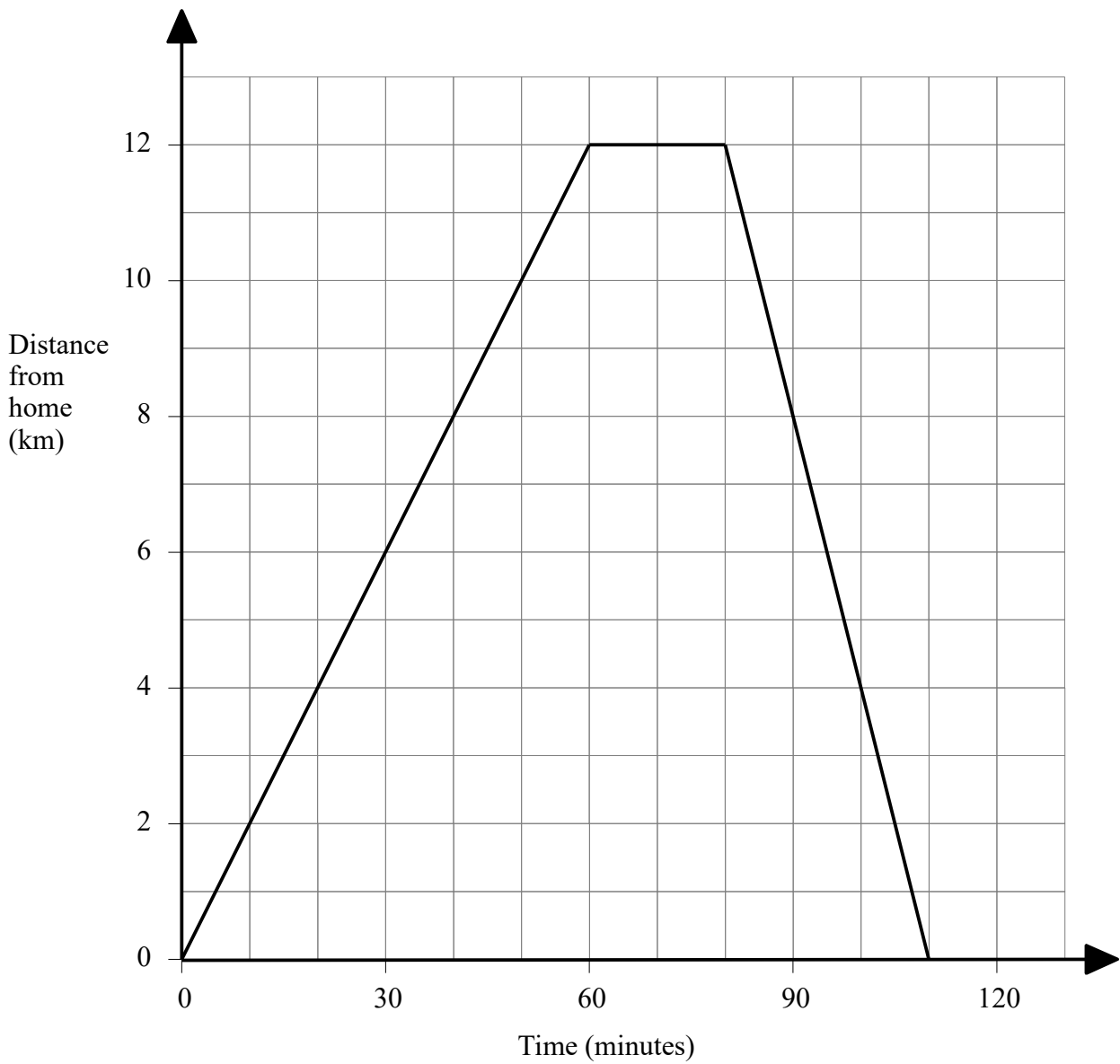
Information

- The marks for each question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end

- 1 Rebecca went on a bike ride.
This graph shows Rebecca's distance from home on her bike ride.



- (a) How far had Rebecca travelled after 30 minutes?

.....km
(1)

- (b) After 60 minutes, Rebecca stopped for a rest.
For how many minutes did she rest?

.....minutes
(1)

- (c) How far did Rebecca travel in total?

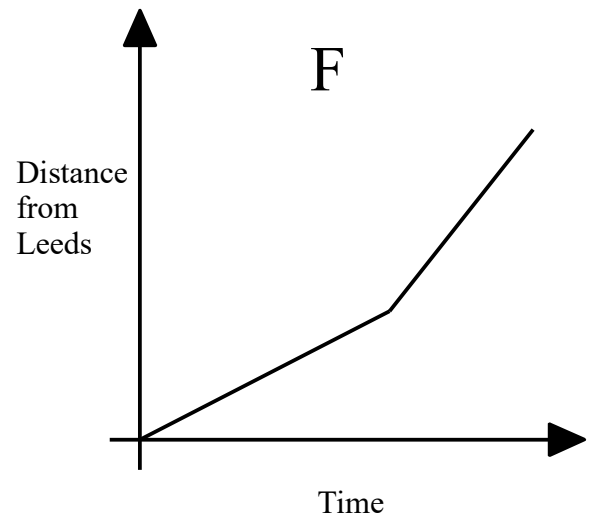
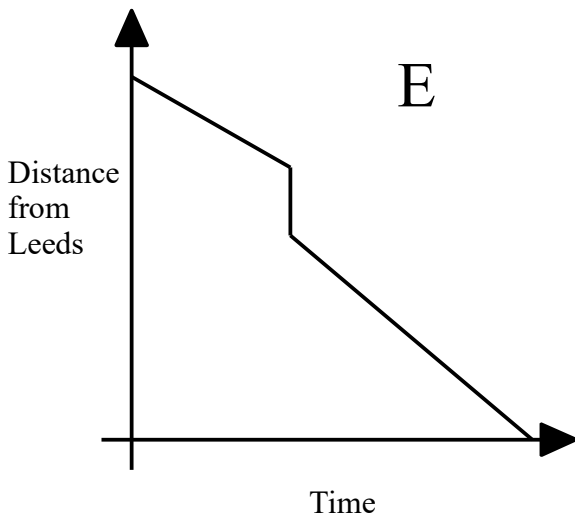
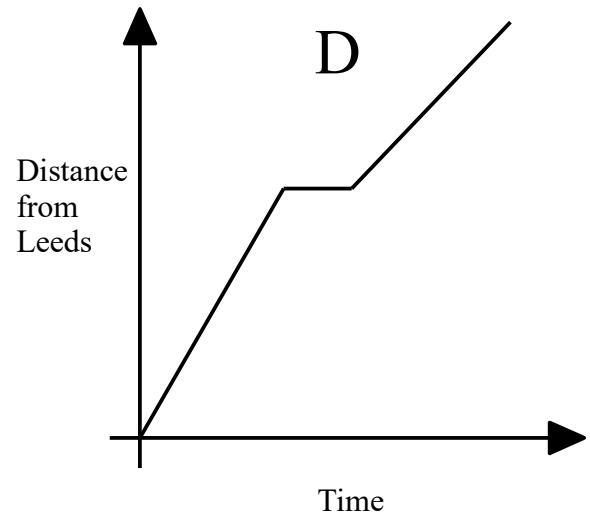
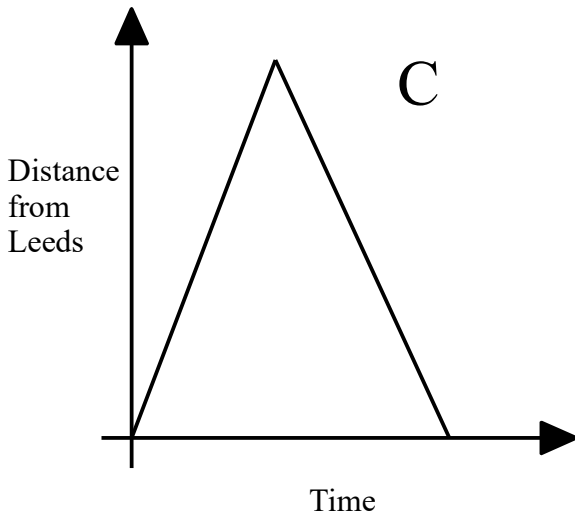
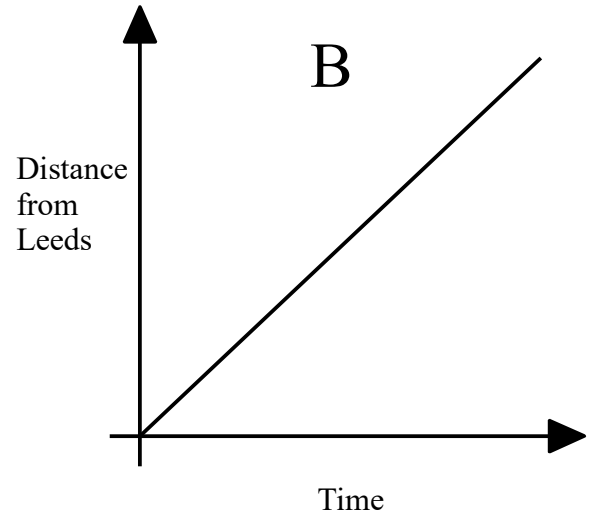
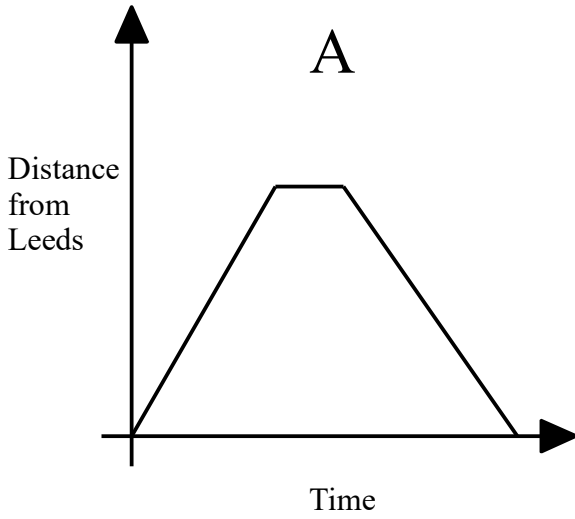
.....km
(1)

(Total for question 1 is 3 marks)

2

Jess drove from Leeds to Liverpool.
She stopped at a service station for 30 minutes on the way.

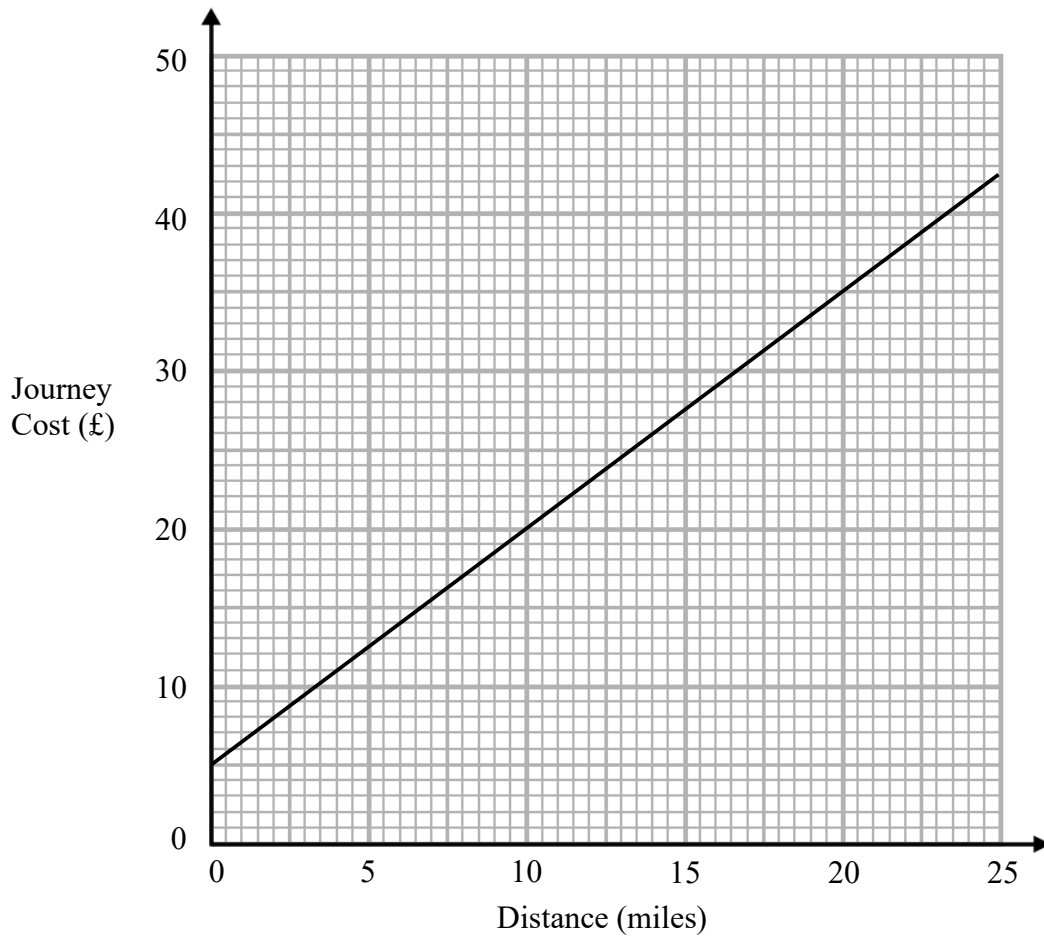
Which of these distance time graphs could represent Jess's journey?



.....
(Total for question 2 is 1 mark)

3 Bill is a taxi driver.

You can use this graph to find the cost of a taxi for different distances.



For each journey there is a fixed charge plus a charge for the distance.

(a) How much is the fixed charge?

£.....
(1)

Bill makes two journeys.

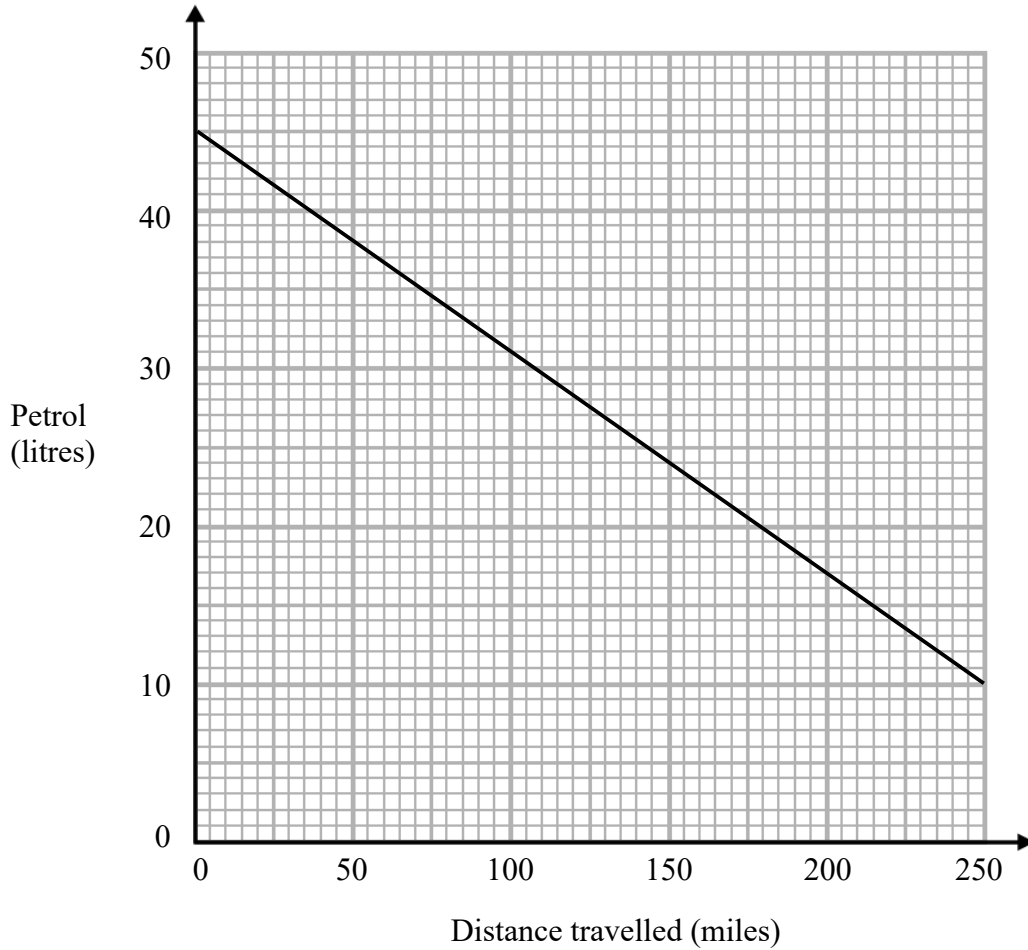
The distance of one journey is 10 miles further than the other journey.

(b) Work out the difference between the two journey costs.

£.....
(2)

(Total for question 3 is 3 marks)

4 John draws a graph to show the amount of petrol his car used on a 250 mile journey.



(a) How much petrol was in John's car at the start of his journey?

..... litres
(1)

(b) How many more miles can John's car travel before it runs out of petrol?

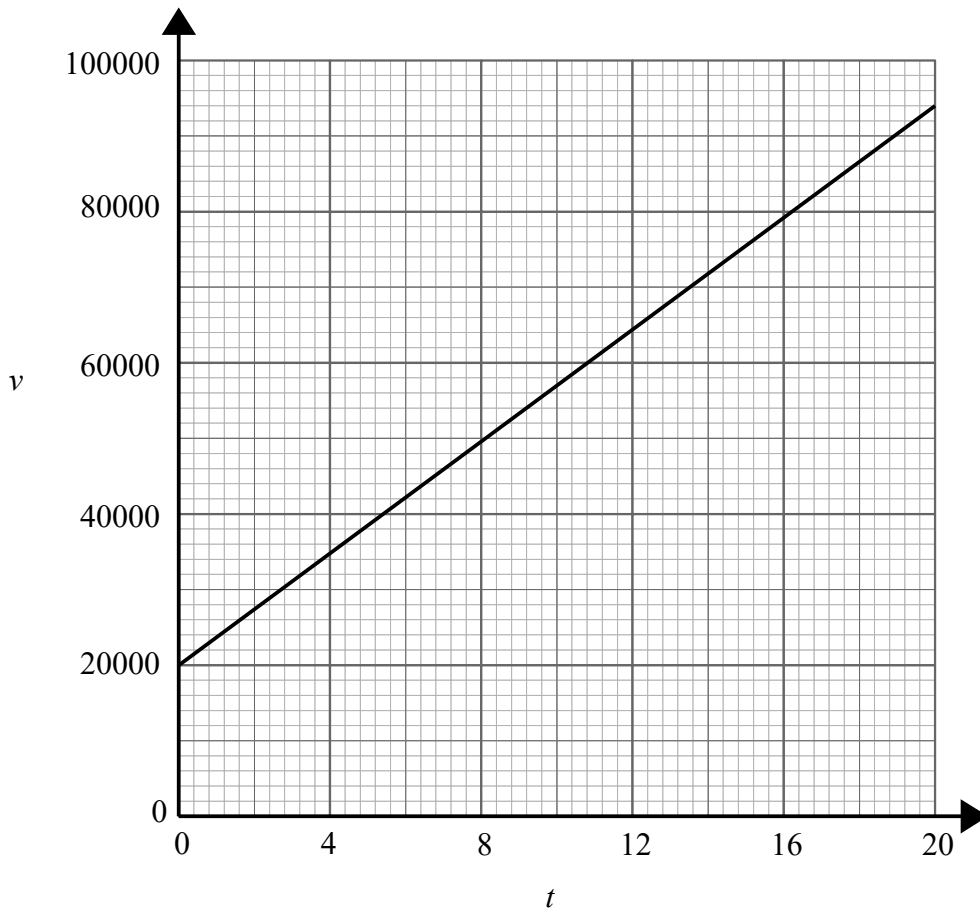
..... miles
(1)

(c) What assumption have you made to calculate your answer to (b)?

.....
.....
(1)

(Total for question 4 is 3 marks)

- 5 Bernie is filling up a swimming pool.
The graph shows the volume v of water in the swimming pool at time t hours.



Work out the rate of that the water is flowing into the pool.

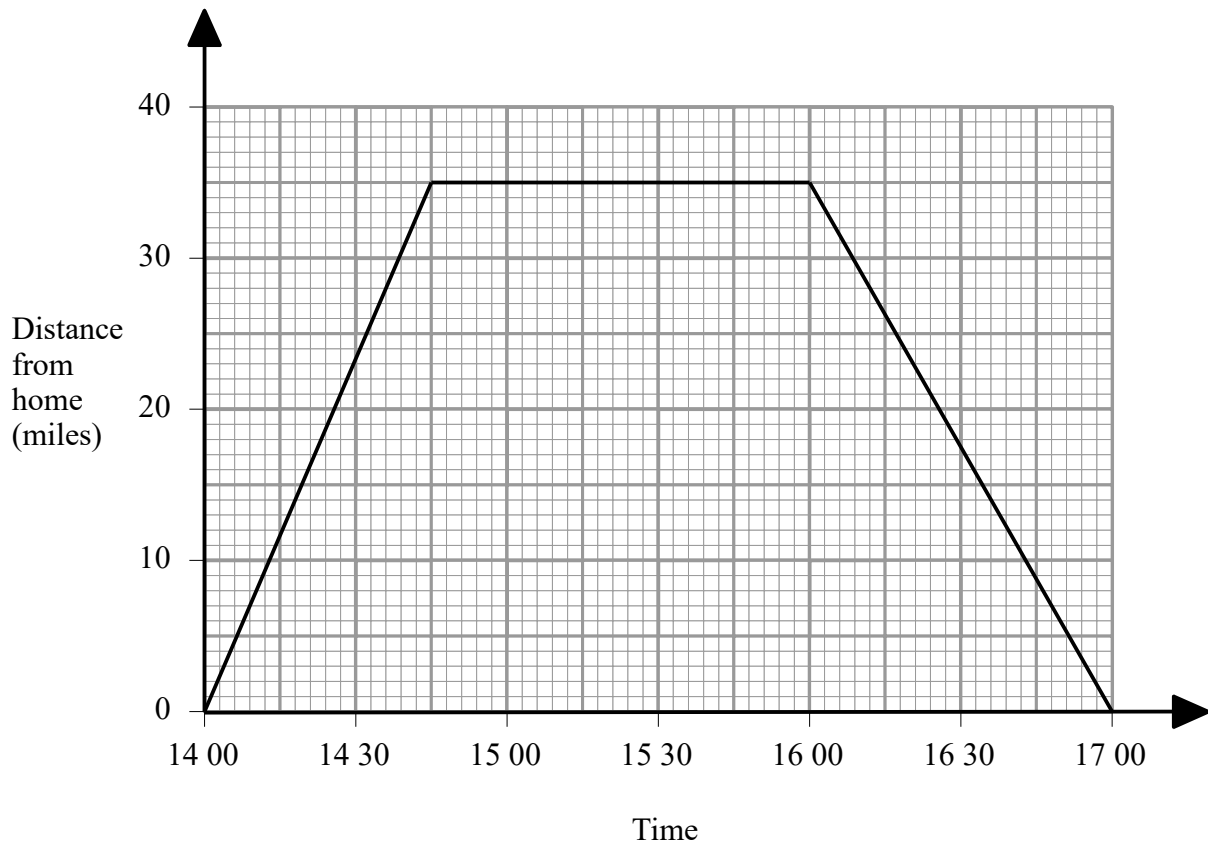
Give your answer in litres per hour.

..... l/hr
(2)

(Total for question 5 is 2 marks)

6 Emily drove to the beach. She stayed at the beach and then she drove back home.

Here is Emily's travel graph.



(a) For how many minutes did Emily stay at the beach?

.....minutes
(1)

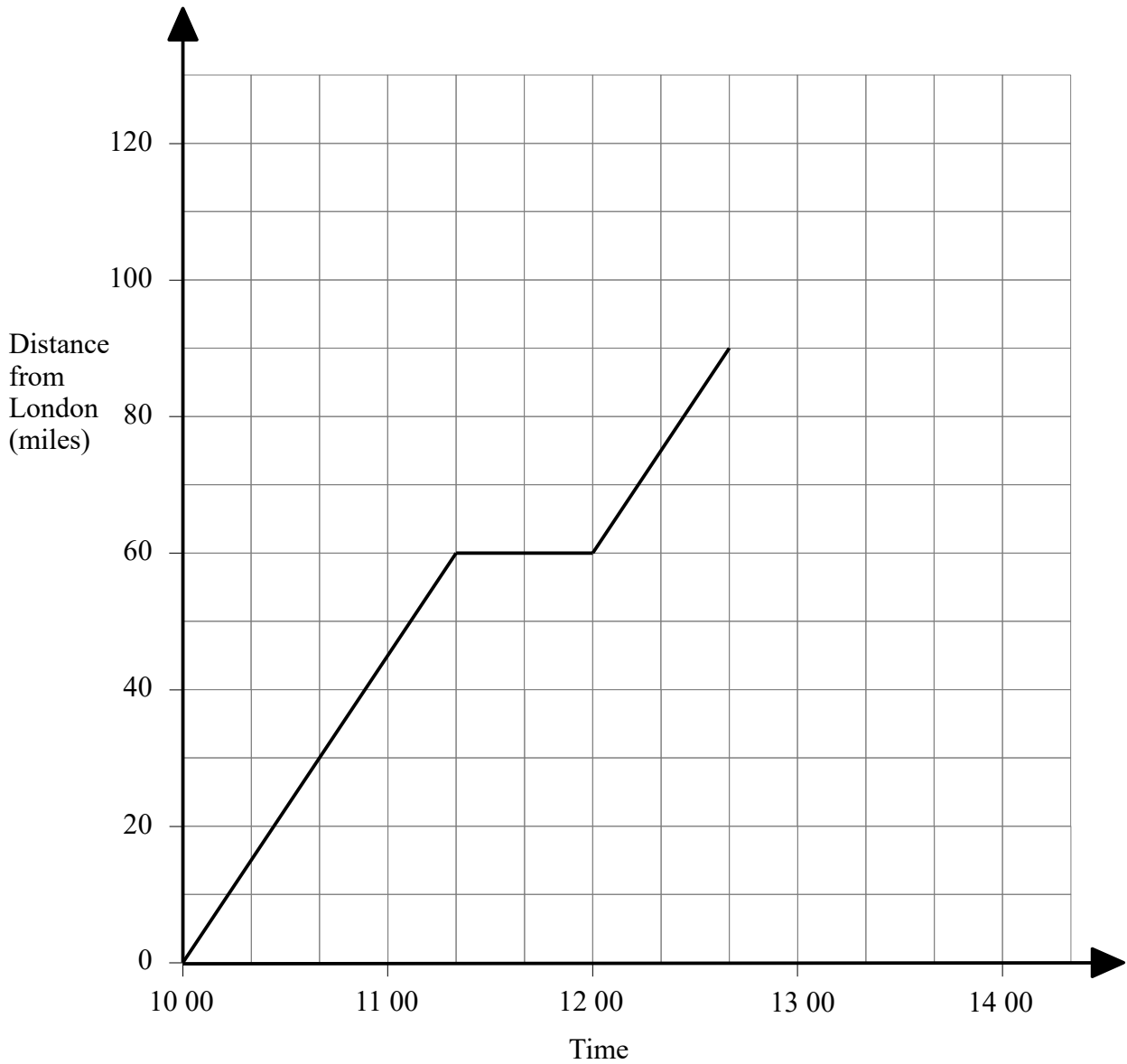
(b) What was Emily's average speed on her **journey to the beach**?

.....miles/hour
(2)

(Total for question 6 is 3 marks)

7 Dawn drove from London to Birmingham. She made one stop at a service station.

Here is part of Dawn's travel graph.



(a) For how many minutes did Dawn stop at the service station?

.....minutes
(1)

(b) What was Dawn's average speed between London and the service station?

.....miles/hour
(2)

(c) Birmingham is 120 miles from London.
Dawn arrived in Birmingham at 14:00.

Complete the graph.

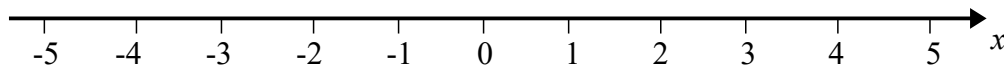
(2)

(Total for question 7 is 5 marks)

- 1 n is an integer such that $-2 \leq n < 3$
Write down all the possible values of n .

(Total for question 1 is 2 marks)

- 2 (a) On a number line, show the inequality $x > -3$ (2)

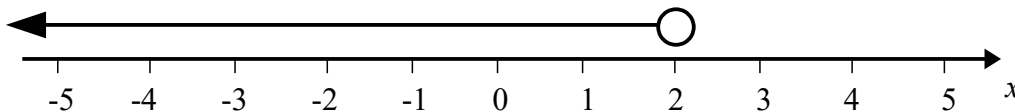


- (b) $1 \leq y < 5$ where y is an integer.
Write down all the possible values of y . (2)

- (c) Solve $4t + 7 \leq 19$ (2)

(Total for question 2 is 6 marks)

- 3 Write down the inequality shown on the number line.



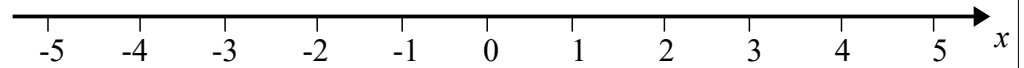
(Total for question 3 is 2 marks)

- 4 (a) $-1 < n \leq 3$ where n is an integer.
Write down all the possible values of n . (2)

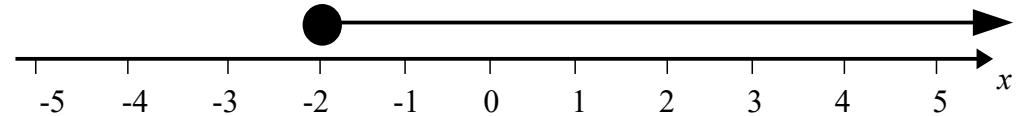
- (c) Solve $2x - 5 > 8$ (2)

(Total for question 4 is 4 marks)

- 5 (a) On a number line, show the inequality $-2 < x < 4$ (2)

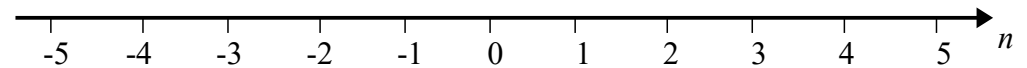


- (b) Write down the inequality shown on the number line. (2)



(Total for question 5 is 4 marks)

- 6 (a) On a number line, show the inequality $n < 2$. (2)

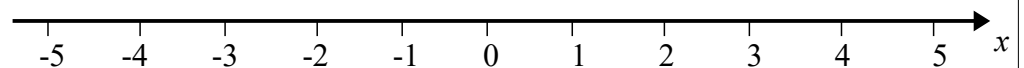


- (b) $4 \leq y < 8$ where y is an integer.
Write down all the possible values of y . (2)

- (c) Solve $4x + 6 \leq x + 21$ (3)

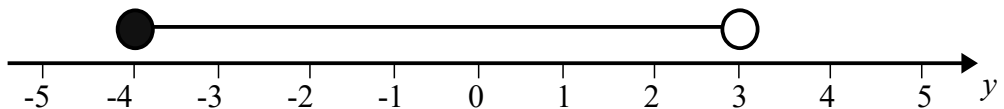
(Total for question 6 is 7 marks)

- 7 Solve $4x \leq x + 6$
Show your answer on a number line.



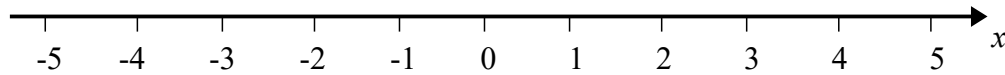
(Total for question 7 is 3 marks)

- 8 Write down the inequality shown on the number line.



(Total for question 8 is 2 marks)

- 9 (a) On a number line, show the inequality $x + 1 \leq 4$ (2)



- (b) $5 < 2y < 12$ where y is an integer.
Write down all the possible values of y . (2)

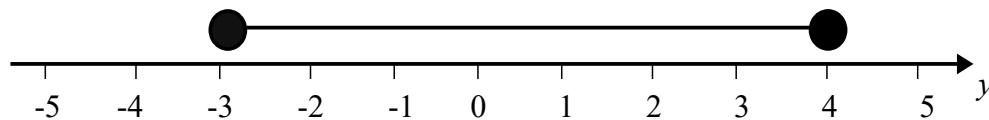
- (c) Solve $4 > 19 - 3x$ (2)

(Total for question 9 is 6 marks)

- 10 n is an integer such that $-8 < 3n < 10$
Write down all the possible values of n .

(Total for question 10 is 2 marks)

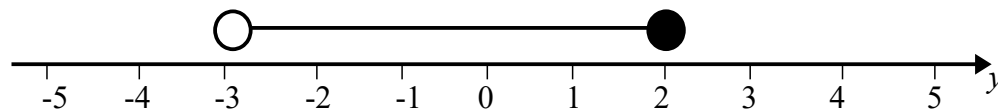
- 11 Write down the inequality shown on the number line.



(Total for question 11 is 2 marks)

- 12 (a) On a number line, show the inequality $-4 < n \leq 5$ (2)

- (b) Write down the inequality shown on the number line. (2)



(Total for question 12 is 4 marks)

- 13 Solve $2(3n - 5) > 12$

(Total for question 13 is 2 marks)

- 14 n is an integer such that $-3 < 2n < 6$
Write down all the possible values of n .

(Total for question 14 is 2 marks)

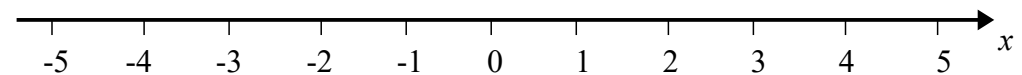
- 15 Solve $3(n + 1) < 24$

(Total for question 15 is 2 marks)

- 16 Solve $4(2x + 1) > 9$

(Total for question 16 is 2 marks)

- 17 (a) On a number line, show the inequality $-3 \leq x + 2 < 2$ (3)



- (b) $1 \leq 2y - 3 < 9$ where y is an integer.
Write down all the possible values of y . (3)

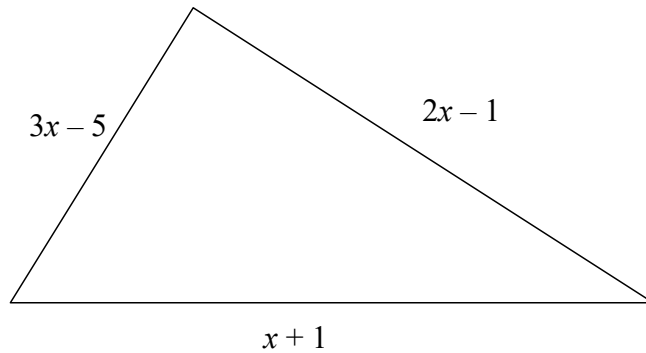
- (c) Solve $4x - 4 \leq 7x - 19$ (3)

(Total for question 17 is 9 marks)

Workings Out Page

Workings Out Page

- 1 The lengths, in cm, of the sides of a triangle are $3x - 5$, $2x - 1$ and $x + 1$



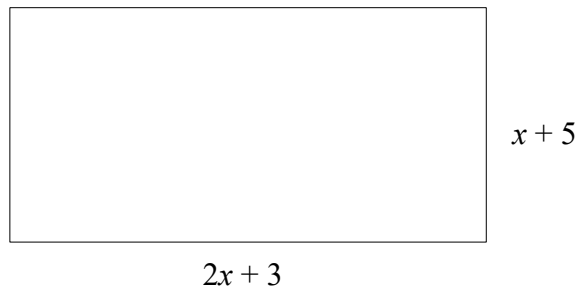
- (a) Write down an expression, in terms of x , for the perimeter of the triangle. (2)

The perimeter of the triangle is 31 cm.

- (b) Work out the value of x . (2)

(Total for question 1 is 4 marks)

- 2 A rectangle has a length of $(2x + 3)$ cm and a width of $(x + 5)$ cm.

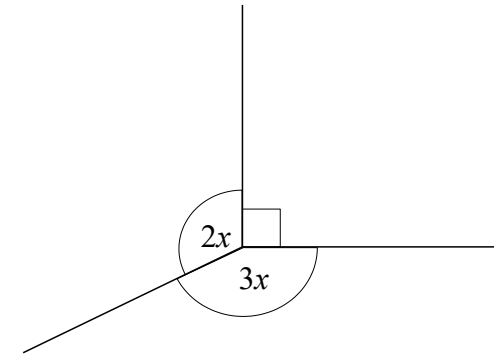


- (a) Find an expression for the perimeter of the rectangle. (2)

- (b) Given the rectangle has a perimeter of 43 cm find the value of x . (2)

(Total for question 2 is 4 marks)

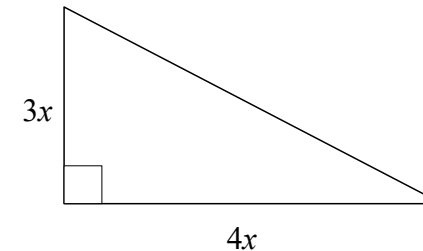
3



Find the value of x .

(Total for question 3 is 3 marks)

- 4 The diagram shows a right angled triangle.

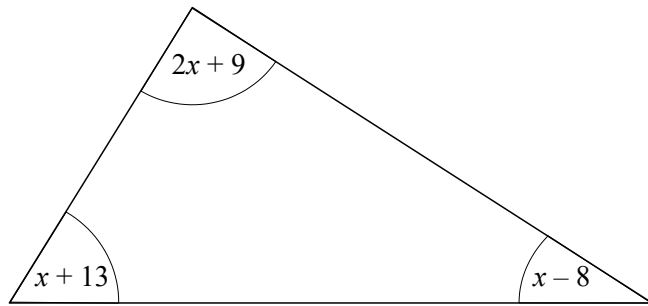


The area of the triangle is 294 cm^2

Work out the value of x .

(Total for question 4 is 3 marks)

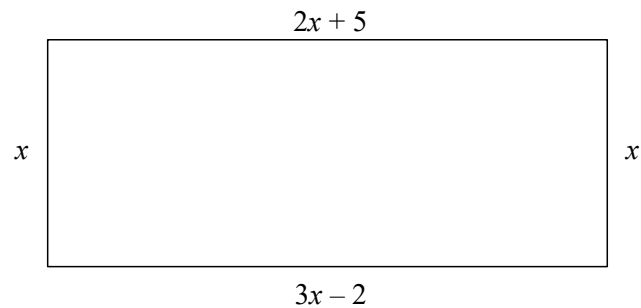
- 5 The sizes of the angles, in degrees, of a triangle are $2x + 9$, $x + 13$ and $x - 8$



Work out the value of x .

(Total for question 5 is 3 marks)

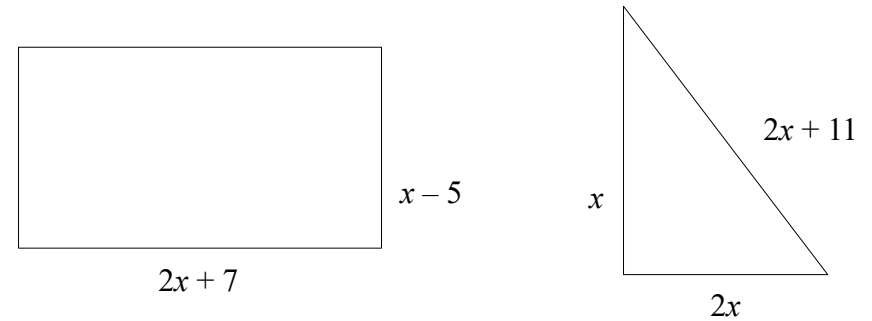
- 6 The diagram shows a rectangle.
All measurements are in centimetres.



Find the perimeter of the rectangle.

(Total for question 6 is 3 marks)

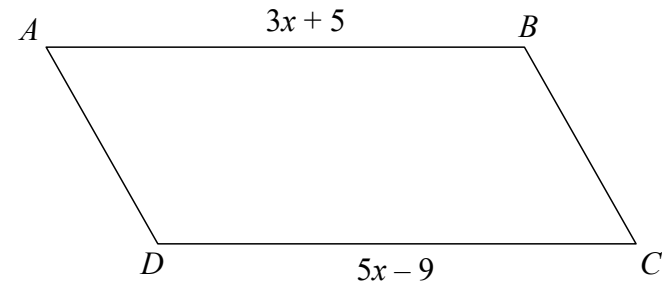
- 7 The diagram shows a rectangle and a triangle.



The perimeter of the rectangle is equal to the perimeter of the triangle.
Find the value of x .

(Total for question 7 is 3 marks)

- 8

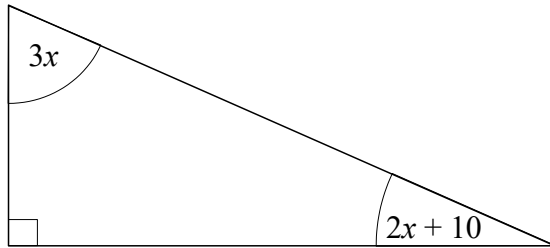


$ABCD$ is a parallelogram
All measurements are in centimetres.
The perpendicular height of the parallelogram is 5 cm.

Find the area of $ABCD$

(Total for question 8 is 4 marks)

- 9 The diagram shows a right-angled triangle.
All of the angles are in degrees.



Find the value of size of the smallest angle in the triangle.

(Total for question 9 is 3 marks)

- 10 Adam has some marbles.
Bradley has twice as many marbles as Adam.
Chris has 5 more marbles than Bradley.

In total they have 55 marbles.

How many marbles does Chris have?

(Total for question 10 is 3 marks)

- 11 The size of the largest angle in a triangle is three times the size of the smallest angle.
The other angle is 35° more than the smallest angle.

Work out, in degrees, the size of each angle in the triangle.
You must show your working.

(Total for question 11 is 5 marks)

- 12 Lucy is three times as old as Alex.
Lucy is 7 years older than Megan.
The sum of their ages is 126.

Find the ratio of Alex's age to Lucy's age to Megan's age.

(Total for question 12 is 4 marks)

Workings Out Page

Workings Out Page

1 Here are the first five terms of a sequence.

2 4 7 11 16

Write down the next two terms in the sequence.

(2 marks)

2 The first term in a sequence is 3.
The term to term rule is add 5.

Is 97 a term in the sequence?

Give a reason for your answer.

(2 marks)

3 Here are the first five terms of a Fibonacci sequence

1 2 3 5 8

Write down the next two terms in the sequence.

(2 marks)

4 The n th term of a sequence is $4n + 3$

(a) Find the first two terms of this sequence.

(b) Is 35 a term in this sequence.

You must show how you get your answer.

(2 marks)

5 The n th term of a sequence is $n^2 + 1$

(a) Find the first two terms of this sequence.

(b) Is 35 a term in this sequence.

You must show how you get your answer.

(2 marks)

6 Here are the first 5 terms of a sequence.

17 14 11 8 5

(a) Find the next term of this sequence.

The n th term of a different sequence is $10n^2 + 5$

(b) Work out the 5th term of this sequence.

(2 marks)

7 Here are the first four terms of a sequence.

7 13 19 25

(a) Write down the next term in the sequence.

(b) Explain how you got your answer

(2 marks)

8 Here are the first four terms of a number sequence.

2 3 5 9

The rule to continue the sequence is

multiply the previous term by 2 and then subtract 1

Work out the 5th term of this sequence.

(1 mark)

9 Here are the first 5 terms of a Fibonacci sequence.

2 2 4 6 10

Find the 8th term of this sequence.

(2 marks)

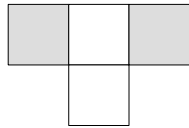
10 The n th term of a sequence is $n^2 + 3$

(a) Find the first three terms of this sequence.

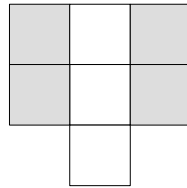
(b) Find the 10th term in this sequence.

(3 marks)

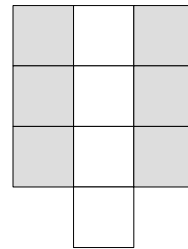
- 11 Here is a sequence of patterns made from white tiles and grey tiles.



pattern number 1



pattern number 2



pattern number 3

- (a) Draw pattern number 4.
 (b) Work out the total number of tiles to make pattern number 7.

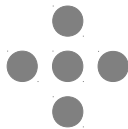
Kyle says

“There are 4 white tiles in pattern number 3 so there will be 8 white tiles in pattern number 6.”

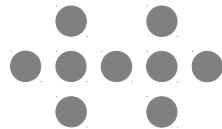
- (c) Is Kyle right?
 You must give a reason for your answer.

(4 marks)

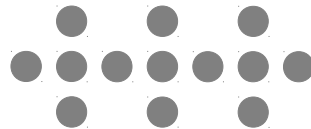
- 12 Here is a sequence of patterns made from grey counters.



pattern number 1



pattern number 2



pattern number 3

- (a) Draw pattern number 4.
 (b) Work out the total number of counters to make pattern number 10.

(3 marks)

- 13 Here are the first five terms of a sequence.

31 27 23 19 15

- (a) Find the first negative term in the sequence.
 (b) Is -30 a term in this sequence?
 Give a reason for your answer.

(3 marks)

- 14 Here are the first 5 terms of an arithmetic sequence.

-3 1 5 9 13

- (a) Find an expression, in terms of n , for the n th term of this sequence.
 The n th term of a different arithmetic sequence is $2n - 3$
 (b) Is 101 a term in this sequence?
 Show how you get your answer.

(4 marks)

- 15 Here are the first 5 terms of a sequence.

9 14 19 24 29

Find an expression, in terms of n , for the n th term of this sequence.

(2 marks)

- 16 Here are the first 5 terms of a sequence.

25 22 19 16 13

Find an expression, in terms of n , for the n th term of this sequence.

(2 marks)

Workings Out Page

Workings Out Page

17 Here are the first four terms of an arithmetic sequence.

4 11 18 25

Write down an expression, in terms of n , for the n th term of the sequence.

(2 marks)

18 Here are the first four terms of an arithmetic sequence.

35 31 27 23

Write down an expression, in terms of n , for the n th term of the sequence.

(2 marks)

19 Here are the first five terms of an arithmetic sequence.

21 27 33 39 45

Write down an expression, in terms of n , for the n th term of the sequence.

(2 marks)

20 Here are the first five terms of an arithmetic sequence.

2 7 12 17 22

Write down an expression, in terms of n , for the n th term of the sequence.

(2 marks)

- 1** (a) Expand $7(2x + 7)$ (1)
 (b) Factorise $3y + 12$ (1)
(2 marks)

- 2** (a) Expand $5a(a - 6)$ (2)
 (b) Solve $4(b + 2) = 24$ (2)
(4 marks)

- 3** (a) Factorise fully $12m + 8m^2$ (2)
 (b) Solve $3(n - 5) = 27$ (2)
(4 marks)

- 4** (a) Expand $8(3s - 2)$ (1)
 (b) Factorise $4t + 20$ (1)
(2 marks)

- 5** (a) Factorise fully $5a^2b + 15ab^2$ (2)
 (b) Solve $6(c - 8) = 42$ (2)
(4 marks)

- 6** (a) Factorise $18x + 24$ (1)
 (b) Expand $3(2y - 4)$ (1)
(2 marks)

- 7** (a) Expand $p(p - 3)$ (1)
 (b) Factorise $16q + 8$ (1)
(2 marks)

- 8** (a) Factorise fully $6x^2 - 4xy$ (2)
 (b) Solve $2(w - 4) = 13$ (2)
(4 marks)

- 9** (a) Factorise $x^2 - 9x$ (1)
 (b) Expand $6(5y + 1)$ (1)
(2 marks)

- 10** (a) Expand $3(5x - 8)$ (1)
 (b) Factorise $18y + 15$ (1)
(2 marks)

- 11** (a) Expand $7(2h - 3)$ (1)
 (b) Expand and Simplify $4(g + 5) + 3(g - 2)$ (2)
(3 marks)

- 12** (a) Factorise fully $7xy + 21x$ (2)
 (b) Solve $6(p + 3) = 42$ (2)
(4 marks)

- 13** (a) Expand $a(a + b)$ (1)
 (b) Factorise $15y - 6$ (1)
(2 marks)

- 14** (a) Expand $9x(3y - 8)$ (2)
 (b) Expand and Simplify $7(t - 4) + 5(t - 2)$ (2)
(4 marks)

Workings Out Page

Workings Out Page

15 (a) Factorise fully $30x^3 + 12x$ (2)

(b) Solve $5(f - 2) = 22$ (2)

(4 marks)

16 (a) Expand $x(8x + 1)$ (1)

(b) Factorise $18 + 63y$ (1)

(2 marks)

17 (a) Expand $2x^2(4x - 9)$ (2)

(b) Expand and Simplify $6(y + 3) - 5(y - 4)$ (2)

(4 marks)

18 (a) Factorise fully $30a^2 + 40ab$ (2)

(b) Solve $3(g + 9) = 21$ (2)

(4 marks)

19 (a) Expand $n(5n + 1)$ (1)

(b) Factorise $18m + mn$ (1)

(2 marks)

20 (a) Expand $3x(7x^2 - y)$ (2)

(b) Expand and Simplify $3(6y + 5) - 2(4y - 1)$ (2)

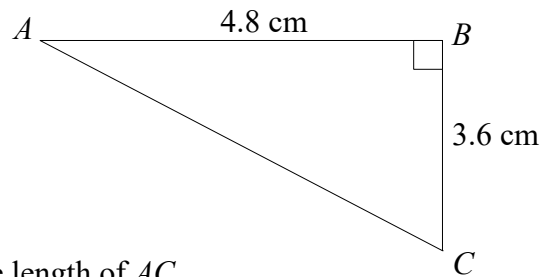
(4 marks)

21 (a) Factorise fully $18a^2bc + 30abc^2$ (2)

(b) Expand and Simplify $4(2y - 7) - 3(5y - 3)$ (2)

(4 marks)

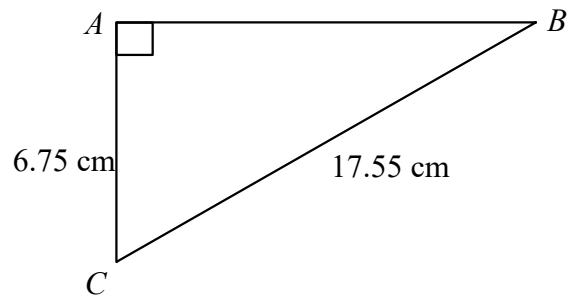
1



Calculate the length of AC .

(Total for question 1 is 3 marks)

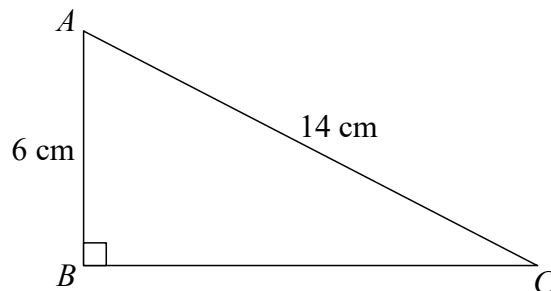
2



Calculate the length of AB .

(Total for question 2 is 3 marks)

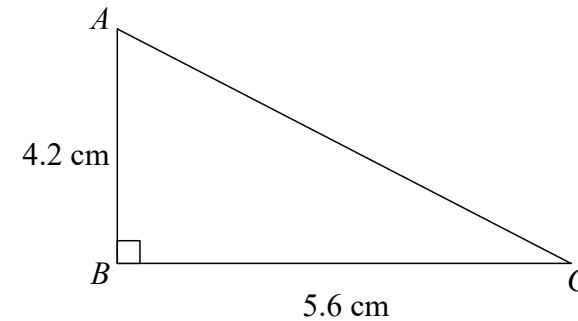
3



Calculate the length of BC .
Give your answer to 1 decimal place.

(Total for question 3 is 3 marks)

4

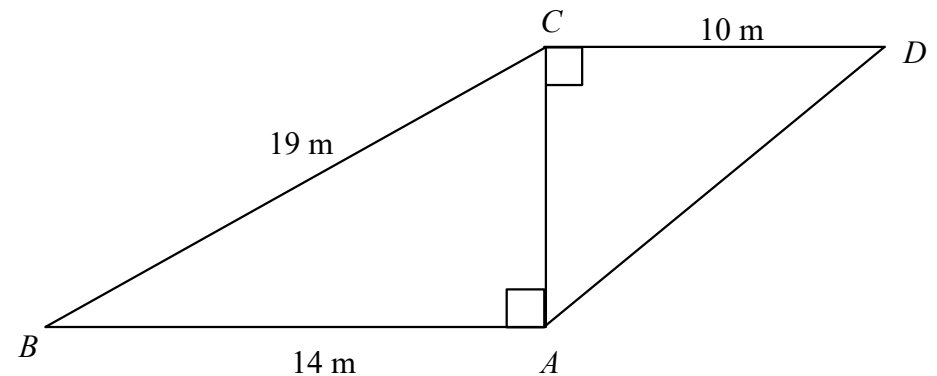


Calculate the length of AC .

(Total for question 4 is 3 marks)

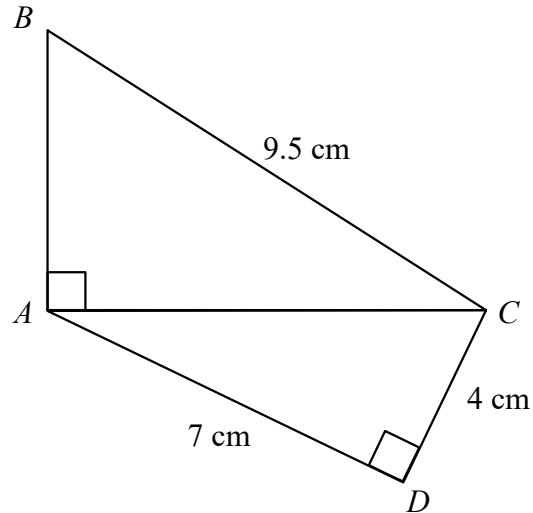
5

Calculate the length of the AD .
Give your answer to 3 significant figures.



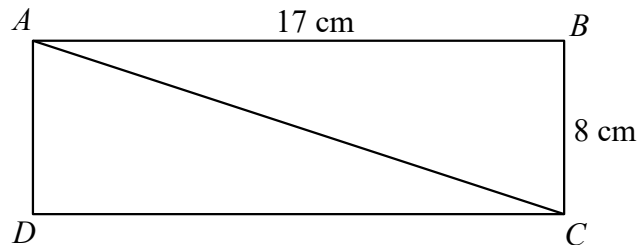
(Total for question 5 is 4 marks)

- 6 Calculate the length of the AB .
Give your answer to 3 significant figures.



(Total for question 5 is 4 marks)

7

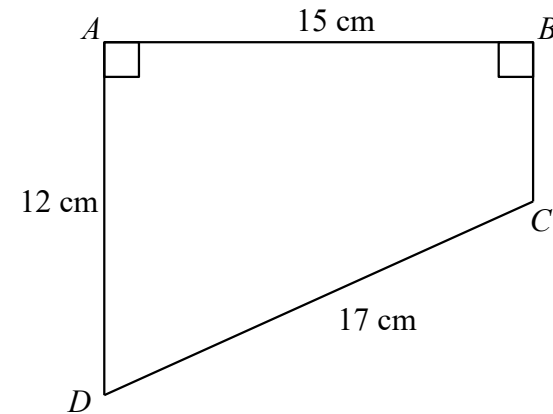


$ABCD$ is a rectangle.
Calculate the length of the diagonal AC .

Give your answer correct to 1 decimal place.

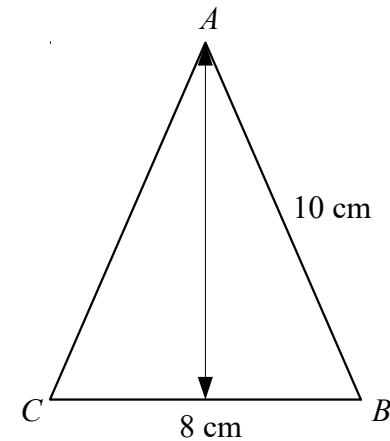
(Total for question 7 is 3 marks)

- 8 $ABCD$ is a trapezium.
Calculate the length of BC .



(Total for question 8 is 3 marks)

- 9 ABC is an isosceles triangle.
Calculate the perpendicular height of ABC .
Give your answer correct to 3 significant figures.



(Total for question 9 is 3 marks)

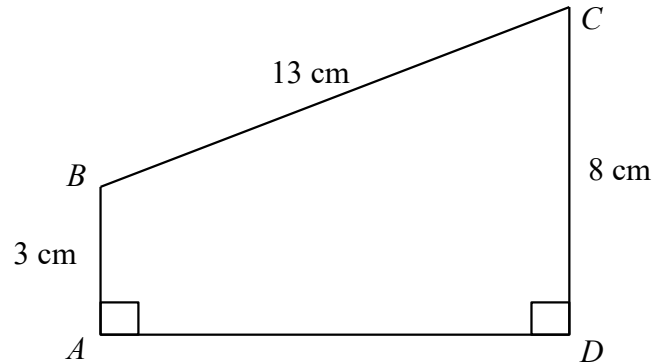
Workings Out Page

Workings Out Page

- 10 $ABCD$ is a trapezium.

Calculate the length of AC .

Give your answer correct to 3 significant figures.



(Total for question 10 is 4 marks)

- 11 A ship leaves point A and sails for 3.7 km due North.
The ship then sails for 2.4 km due East to reach point B.

Calculate the the shortest distance between point A and point B.
Give your answer correct to 1 decimal place.

(Total for question 11 is 3 marks)

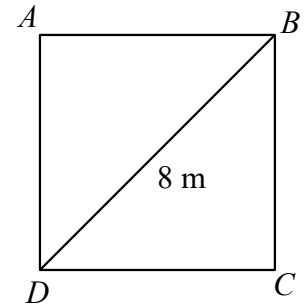
- 12 A ladder reaches 2.5 m up a vertical wall.
The base of the ladder is 70 cm from the base of the wall on a horizontal ground.

Find the length of the ladder.

(Total for question 12 is 4 marks)

- 13 $ABCD$ is a square.
The diagonal of the square is 8 m.

Calculate the perimeter of the square.
Give your answer correct to one decimal place.



(Total for question 13 is 3 marks)

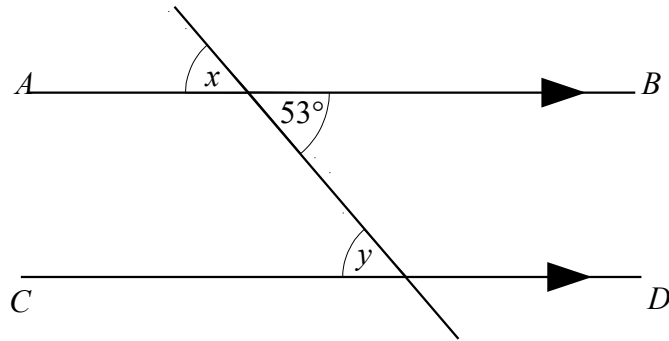
- 14 A television has a diagonal length of 50 inches.

The ratio of the length of the television to the width of the television is 4:3

Calculate the length and the width of the television.
Give your answers correct to 1 decimal place.

(Total for question 14 is 3 marks)

1

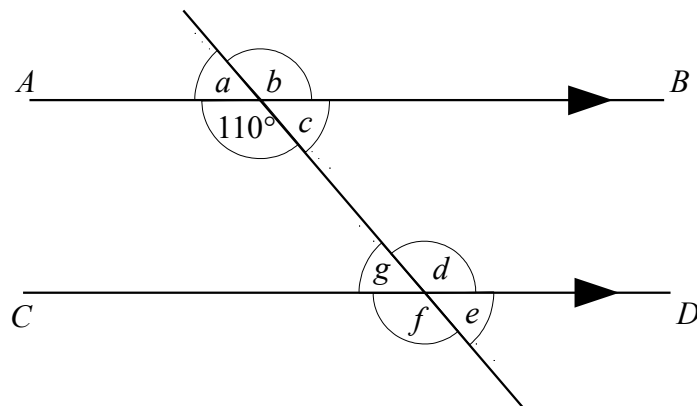


AB and CD are parallel lines.

- (a) Write down the size of angle x (1)
 (b) Give a reason for your answer. (1)
 (c) Write down the size of angle y . (1)
 (d) Give a reason for your answer. (1)

(Total for question 1 is 4 marks)

2



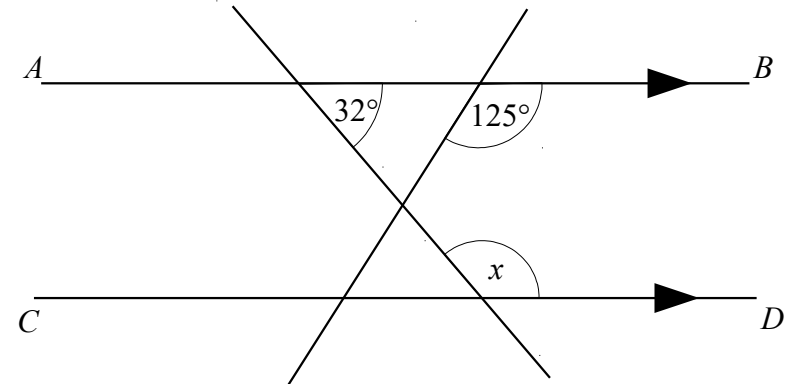
AB and CD are parallel lines.

An angle of 110° is shown on the diagram.

- (a) Write down the letter of one other angle of size 110° (1)
 (b) Give a reason for your answer. (2)

(Total for question 2 is 3 marks)

3

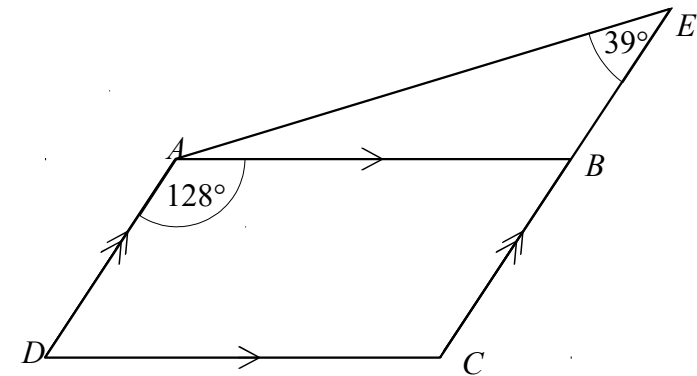


AB and CD are parallel lines.

- (a) Find the size of angle x (1)
 (b) Give a reason for your answer. (2)

(Total for question 3 is 3 marks)

4



$ABCD$ is a parallelogram.

CBE is a straight line.

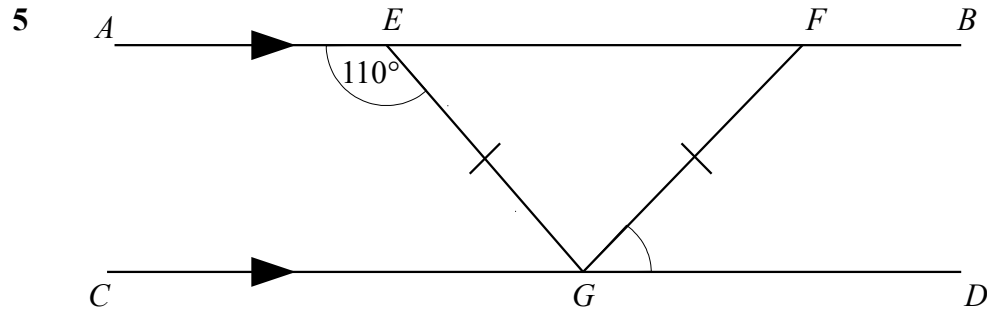
Angle $BAD = 128^\circ$

Angle $AEB = 39^\circ$

Find the size of angle BAE .

Give a reason for each stage of your working.

(Total for question 4 is 3 marks)



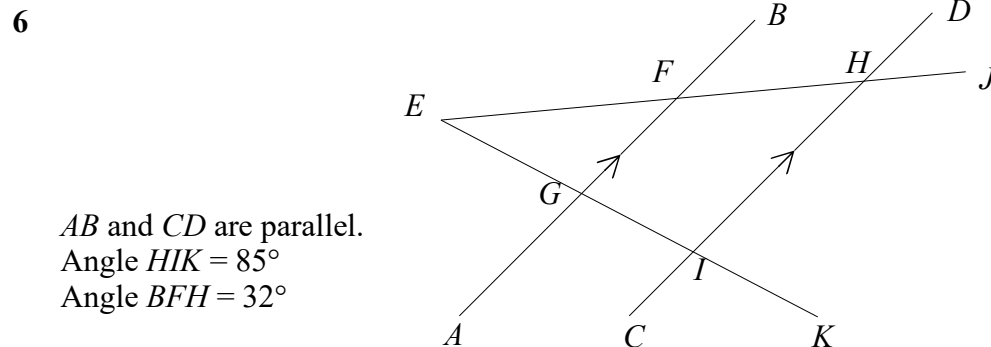
AB and CD are parallel lines.
 EFG is an isosceles triangle

Angle $AEG = 110^\circ$

Find the size of angle FGD .

Give a reason for each stage of your working.

(Total for question 5 is 3 marks)

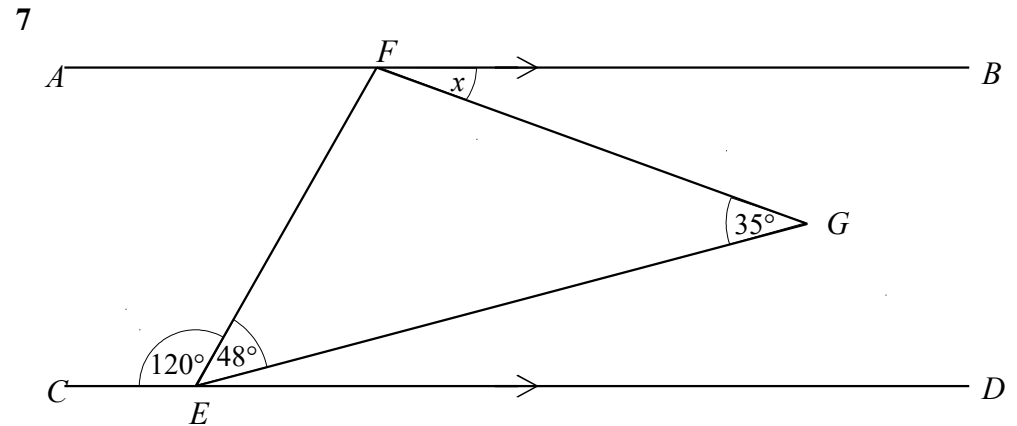


AB and CD are parallel.
 Angle $HIK = 85^\circ$
 Angle $BFH = 32^\circ$

Find the size of angle FEG .

You must show how you got your answer.

(Total for question 6 is 3 marks)

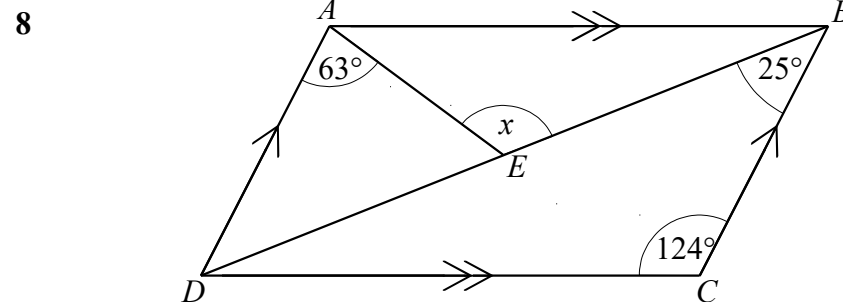


AB and CD are parallel.

Find the size of angle x .

Give a reason for each stage of your working.

(Total for question 7 is 3 marks)



$ABCD$ is a parallelogram.

Angle $DAE = 63^\circ$

Angle $BCD = 124^\circ$

Angle $CBD = 25^\circ$

Calculate the size of angle x .

Give reasons for each stage of your answer.

(Total for question 8 is 3 marks)

1 Work out the size of an exterior angle of a regular hexagon.

(2 marks)

2 Work out the size of each interior angle in a regular octagon.

(2 marks)

3 Work out the size of each interior angle in a regular pentagon.

(2 marks)

4 The size of each exterior angle in a regular polygon is 20° .
Work out how many sides the polygon has.

(2 marks)

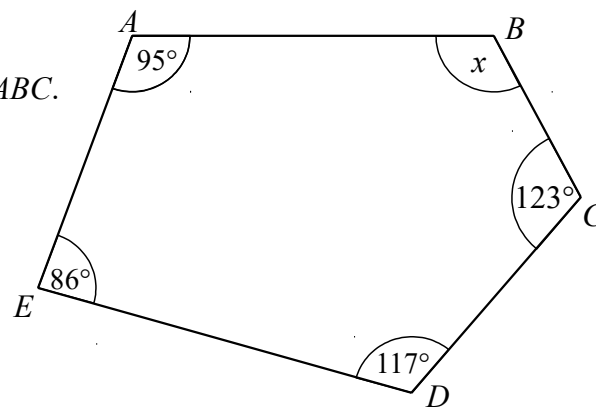
5 The size of each exterior angle in a regular polygon is 18° .
Work out how many sides the polygon has.

(2 marks)

6 The size of each interior angle in a regular polygon is 165° .
Work out how many sides the polygon has.

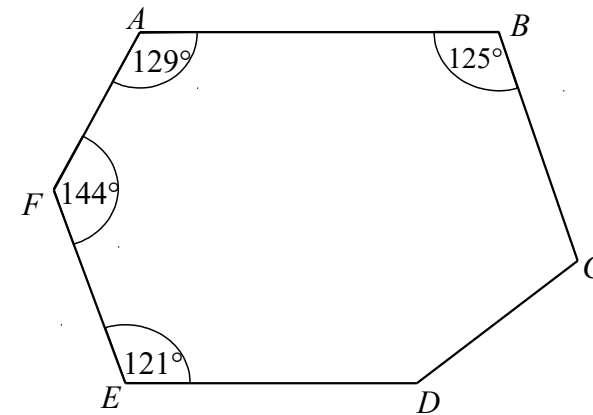
(2 marks)

7 $ABCDE$ is a pentagon.
Work out the size of angle ABC .



(2 marks)

8

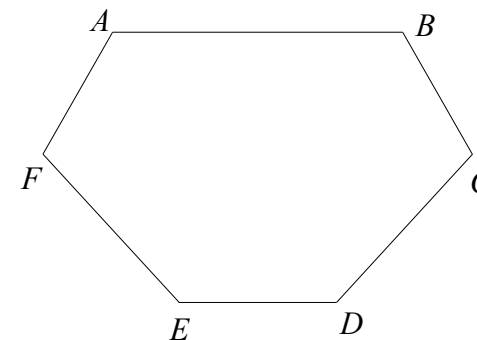


$ABCDEF$ is a hexagon.
Angle $CDE = 2 \times$ Angle BCD

Work out the size of angle CDE .

(3 marks)

9



$ABCDEF$ is a hexagon.
Angle $BAF =$ Angle $ABC =$ Angle $AFE =$ Angle BCD .
Angle $DEF =$ Angle $CDE = 130^\circ$

Work out the size of angle BAF .
You must show all your working.

(3 marks)

Workings Out Page

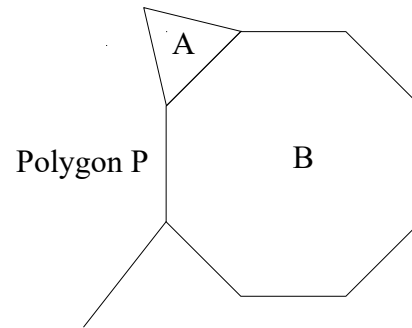
Workings Out Page

- 10 Shape A is a regular triangle.
Shape B is a regular octagon.

Another regular polygon,
P, is shown on the diagram.

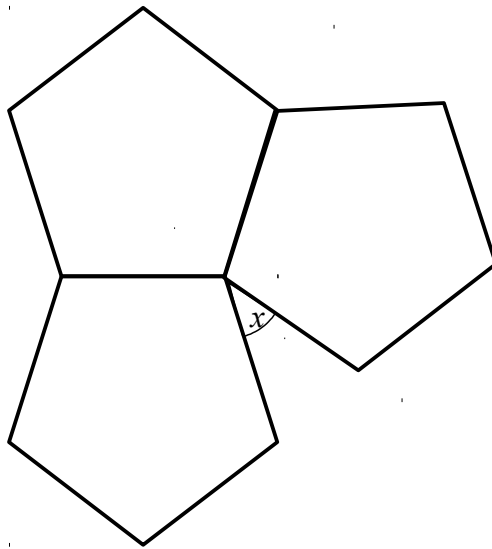
How many sides does polygon P have?

You must show your working.



(4 marks)

11

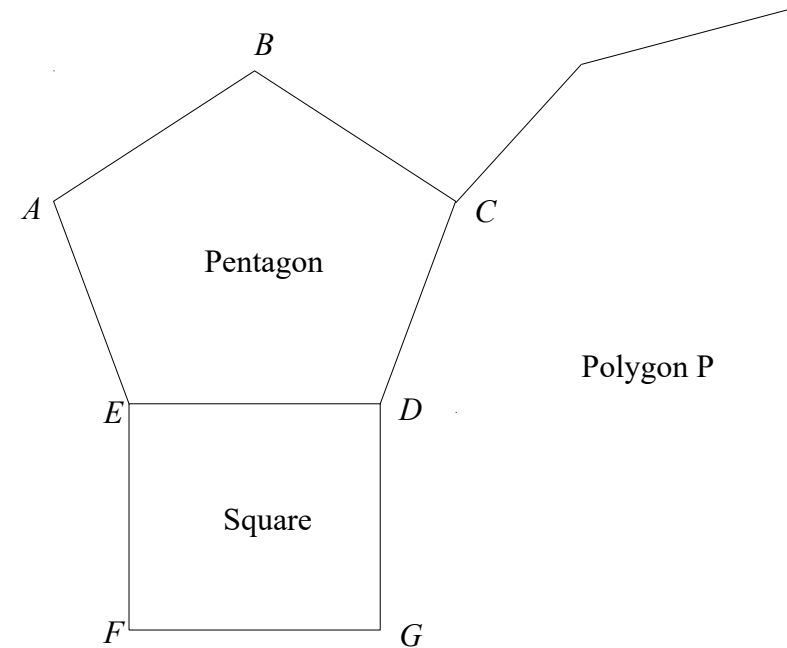


The diagram shows three regular pentagons meeting at a point.

Work out the size of the angle marked x .
You must show all your working.

(3 marks)

12



The diagram shows a regular pentagon, ABCDE, and a square, EDFG.

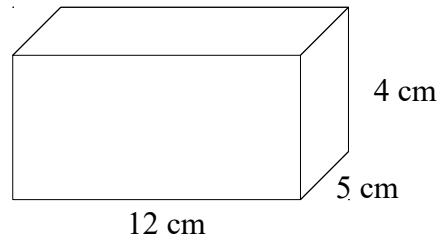
The lines CD and DG are both sides of another regular polygon, P.

How many sides does polygon P have?

You must show how you got your answer.

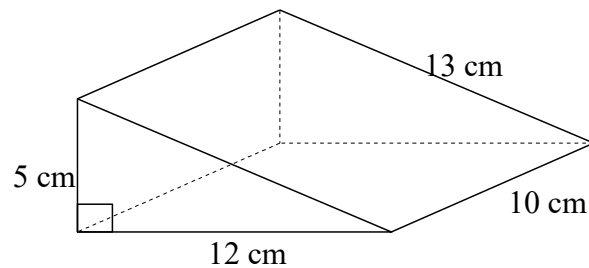
(4 marks)

- 1 The diagram shows a cuboid.
Find the total surface area of the cuboid.



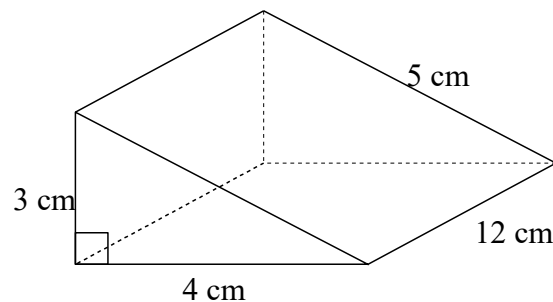
(3 marks)

- 2 The diagram shows a triangular prism.
Find the total surface area of the triangular prism.



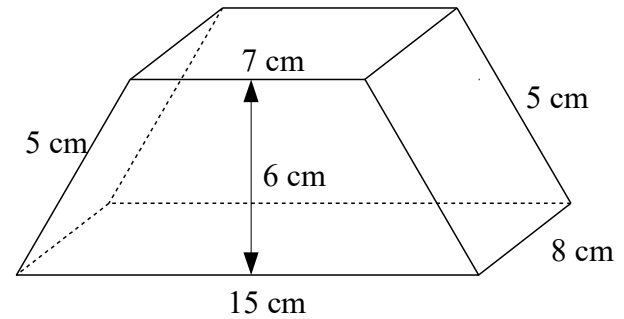
(3 marks)

- 3 The diagram shows a triangular prism.
Find the total surface area of the triangular prism.



(3 marks)

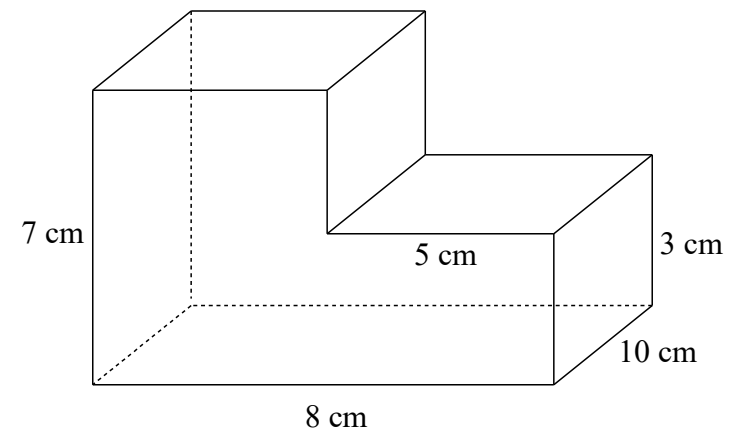
- 4 The diagram shows a prism.



The cross section of the prism is in the shape of a trapezium.
Calculate the total surface area of the prism.

(4 marks)

- 5 The diagram shows a prism.
Calculate the total surface area of the prism.

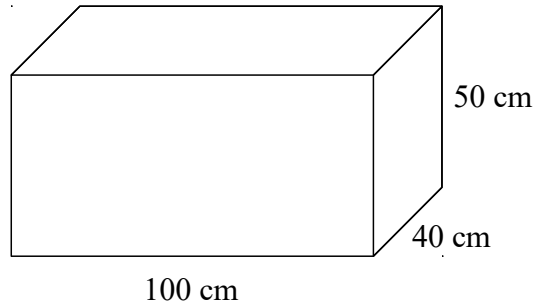


(4 marks)

Workings Out Page

Workings Out Page

- 6 The diagram shows a box.



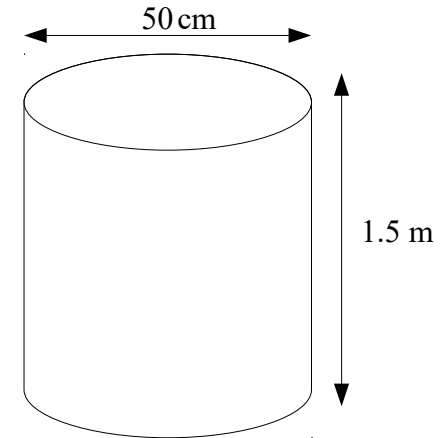
5 of these boxes are going to be painted.

Each pot of paint can cover 6m^2 .

How many pots of paint are needed to paint the 5 boxes?

(4 marks)

- 7 The diagram shows a cylindrical tank.
The tank has a top and a bottom.



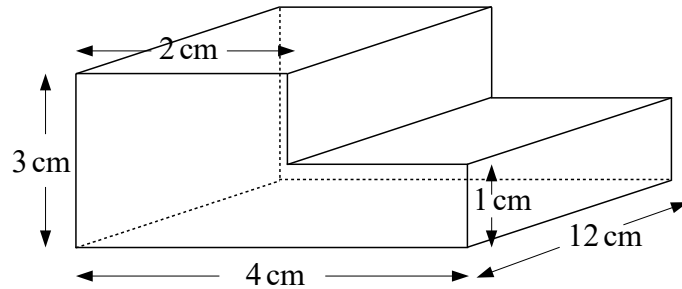
4 of these tanks are going to be painted.
Each tank has a diameter of 50 cm and a height of 1.5 m.

Each pot of paint can cover 4m^2 .

How many pots of paint are needed to paint the 4 tanks?

(4 marks)

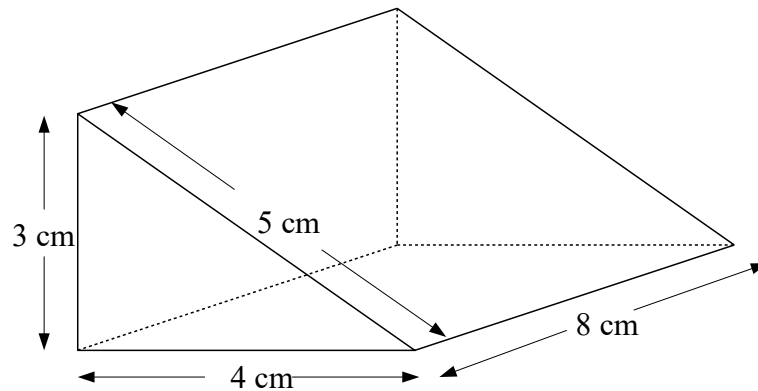
1



The diagram shows a prism.
Work out the volume of the prism.

(Total for question 1 is 3 marks)

2

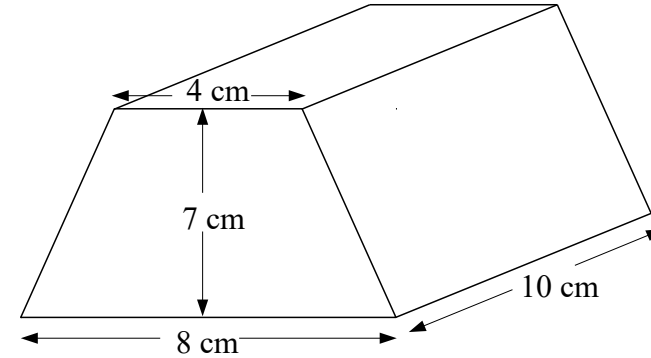


The diagram shows a triangular prism.
The cross-section of the prism is a right angled triangle.

Calculate the volume of the prism.

(Total for question 2 is 3 marks)

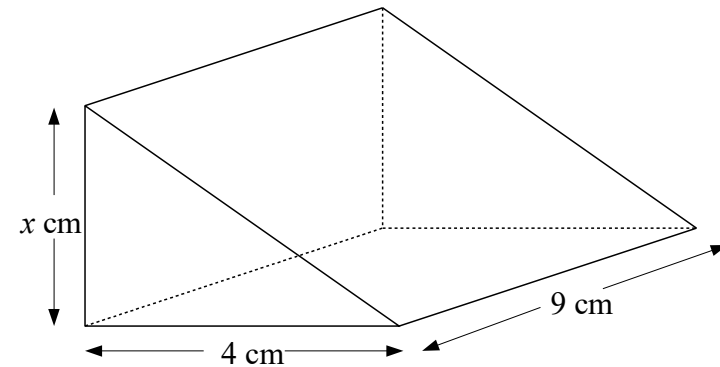
3



The diagram shows a prism.
The cross-section of the prism is a trapezium.
Work out the volume of the prism.

(Total for question 3 is 3 marks)

4



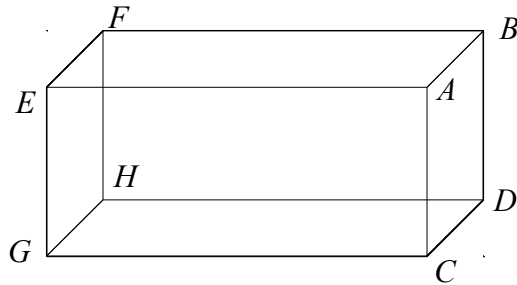
The diagram shows a triangular prism.
The cross-section of the prism is a right angled triangle.

The volume of the prism is 198 cm^3

Calculate the value of x

(Total for question 4 is 3 marks)

5



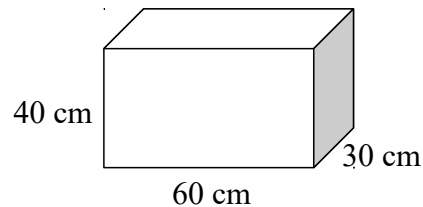
The diagram shows a cuboid $ABCDEFGH$
 $ABCD$ is a square with area 25cm^2 .
 $CG = 12\text{ cm}$.

Find the volume of the cuboid.

(Total for question 5 is 2 marks)

6

Bob has a van.
 He is using the van to deliver boxes.
 Each box is a cuboid, 60 cm by 30 cm by 40 cm.



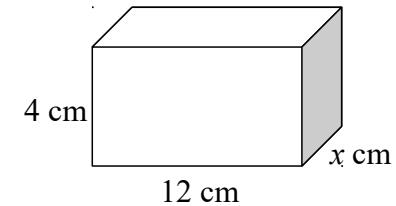
The van has the space for the boxes in the shape of a cuboid with:
 length 3 m, width 1.8 m and height 2 m

Work out how many boxes can Bob fit into the van.

(Total for question 6 is 3 marks)

7

The diagram shows a cuboid.



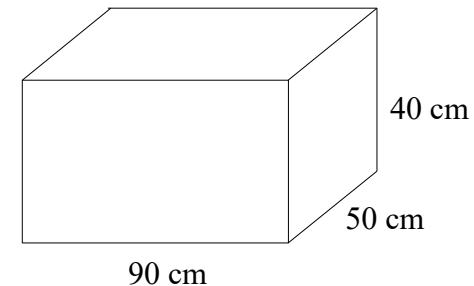
The volume of the cuboid is 120 cm^3

Calculate the value of x

(Total for question 7 is 2 marks)

8

The diagram shows an empty water container.



Fiona is going to use a bucket to fill the container.
 Each bucket can hold 12 litres of water.

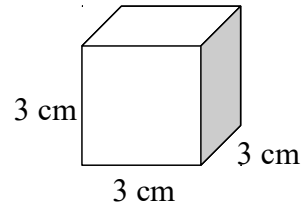
How many buckets of water will be needed to fill the container?

(Total for question 8 is 4 marks)

Workings Out Page

Workings Out Page

- 9 Here is a cube.



Work out the volume of five of these cubes.

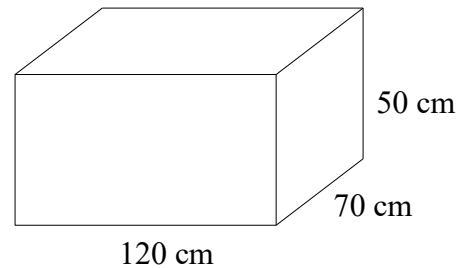
(Total for question 9 is 2 marks)

- 10 The diagram shows an empty water container.

The container is going to be filled using a hose pipe.

The water will flow into the container at a rate of 2 litres per second.

How long will it take for the container to be filled completely?



(Total for question 10 is 4 marks)

- 11 The total surface area of a cube is 150 cm^2 .

Work out the volume of the cube.

(Total for question 11 is 4 marks)

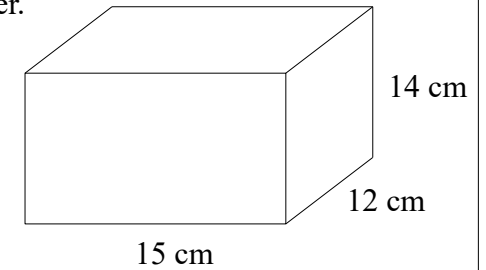
- 12 The diagram shows a water container.

The container is $\frac{2}{3}$ full with water.

The water is going to be used to fill cups.

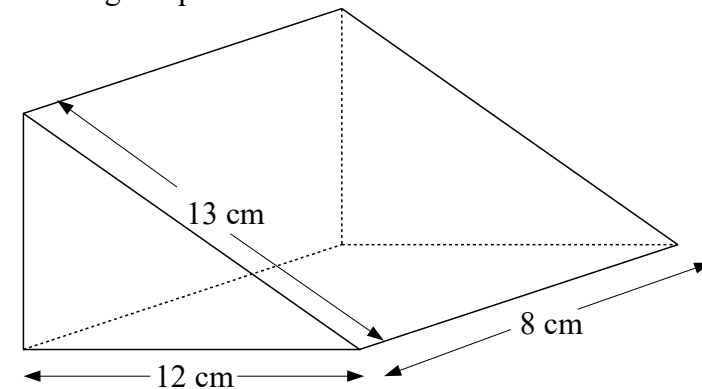
Each cup holds 175 ml of water.

How many cups of water can be completely filled with water from the container



(Total for question 12 is 4 marks)

- 13 Here is a triangular prism.



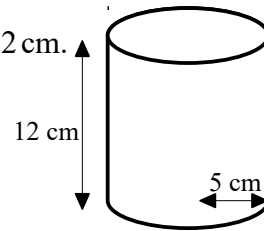
The diagram shows a triangular prism.

The cross-section of the prism is a right angled triangle.

Calculate the volume of the prism.

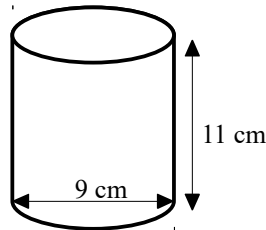
(Total for question 13 is 5 marks)

- 1 A cylinder has a radius of 5 cm and a height of 12 cm.
Work out the volume of the cylinder.
Give your answer in terms of π .



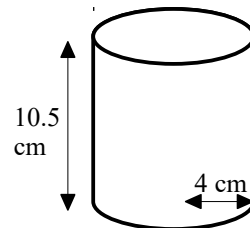
(3 marks)

- 2 A cylinder has a diameter of 9 cm and a height of 11 cm.
Work out the volume of the cylinder.
Give your answer correct to 1 decimal place.



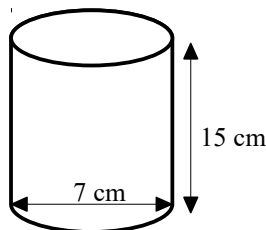
(3 marks)

- 3 A solid cylinder has a radius of 4 cm and a height of 10.5 cm.
Work out the total surface area of the cylinder.
Give your answer correct to 1 decimal place.



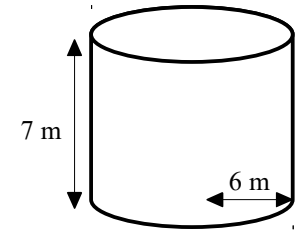
(3 marks)

- 4 A solid cylinder has a diameter of 7 cm and a height of 15 cm.
Work out the total surface area of the cylinder.
Give your answer correct to 3 significant figures.



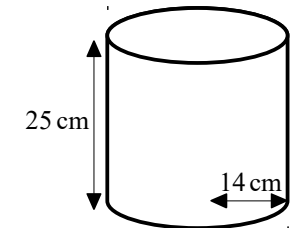
(3 marks)

- 5 A solid cylinder has a radius of 6 m and a height of 7 m.
Work out the total surface area of the cylinder.
Give your answer in terms of π .



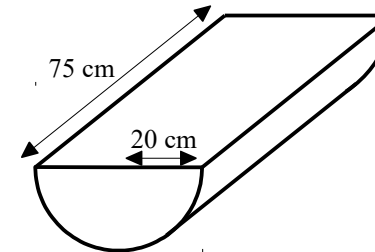
(4 marks)

- 6 A solid cylinder has a radius of 14 cm and a height of 25 cm.
Work out the volume of the cylinder.
Give your answer correct to 3 significant figures.



(4 marks)

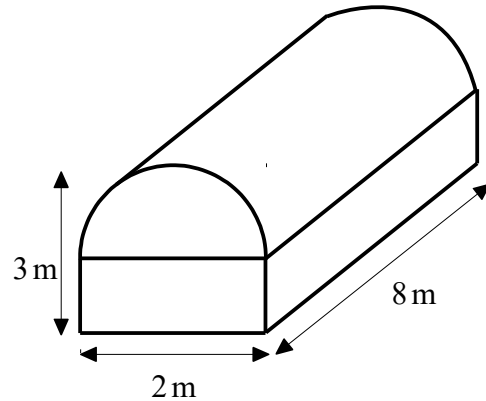
- 7 A solid cylinder is cut in half to form a semi-cylinder with a radius of 20 cm and a length of 75 cm.



- (a) Work out the volume of the semi-cylinder.
Give your answer correct to 3 significant figures. (3)
- (b) Work out the total surface area of the semi-cylinder.
Give your answer correct to 3 significant figures. (3)

(6 marks)

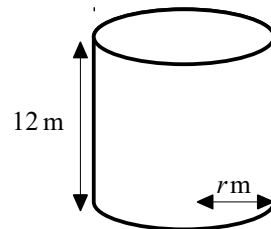
- 8 A solid is formed by placing a half cylinder on a rectangular prism. The solid has a width of 2 m, a total height of 3 m and a length of 8 m.



Work out the volume of the solid.
Give your answer correct to 3 significant figures.

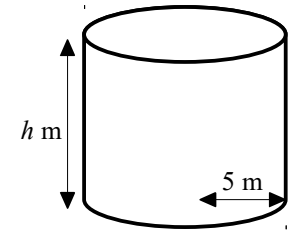
(4 marks)

- 9 A solid cylinder has a radius of r m and a height of 12 m.
The volume of the cylinder is 507π m³.
Find the value of r .



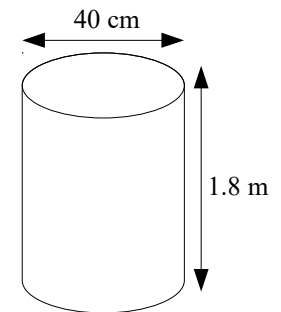
(4 marks)

- 10 A solid cylinder has a radius of 5 m and a height of h m.
The total surface area of the cylinder is 165π m².
Find the value of h .



(4 marks)

- 11 The diagram shows a cylindrical tank.
The tank has a top and a bottom.
5 of these tanks are going to be painted.
Each tank has a diameter of 40 cm
and a height of 1.8 m.



Each pot of paint can cover 4 m².

How many pots of paint are needed to paint the 5 tanks?

(4 marks)

Workings Out Page

Workings Out Page

Name: _____

GCSE (1 – 9)

Loci and Construction

Instructions

- Use **black** ink or ball-point pen.
- Answer all Questions.
- Answer the Questions in the spaces provided
– *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

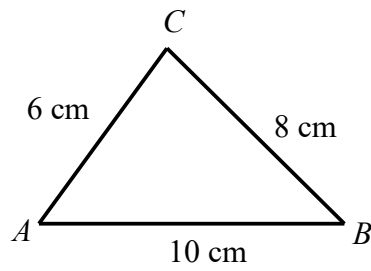
Information

- The marks for each Question are shown in brackets
– *use this as a guide as to how much time to spend on each Question.*

Advice

- Read each Question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every Question.
- Check your answers if you have time at the end

1 ABC is a triangle.



$$AB = 10\text{ cm}$$

$$BC = 8\text{ cm}$$

$$AC = 6\text{ cm}$$

Use ruler and compasses to construct an accurate drawing of triangle ABC .

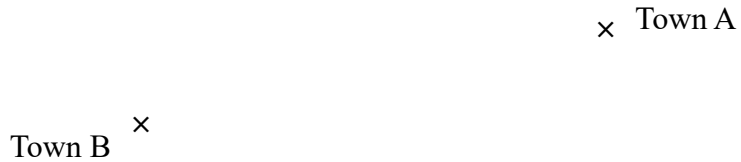
You must show all your construction lines.

(Total for Question 1 is 3 marks)

- 2 A stadium is going to be built.
It must be no more than 10 km from town A and no more than 8 km from town B.

1 cm represents 2 km

Shade the region on the diagram where the stadium can be built.



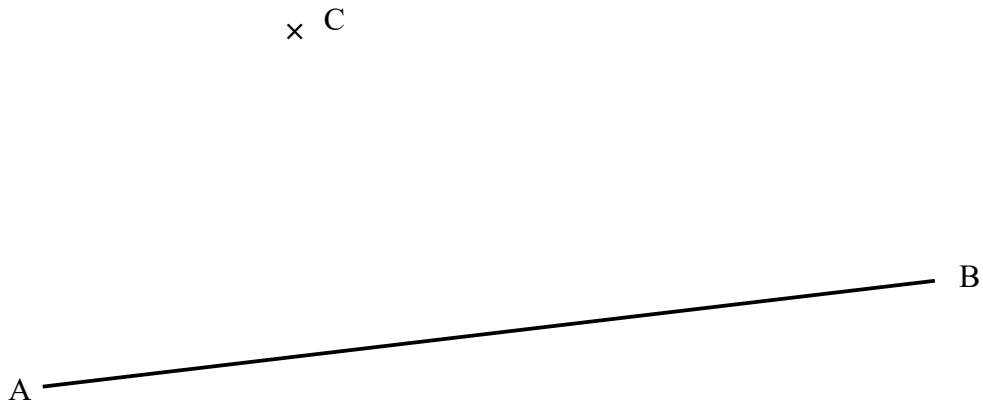
(Total for Question 2 is 2 marks)

- 3 In the space below, use a ruler and compasses to construct an equilateral triangle with side length 6 cm.

You must show all your construction lines.

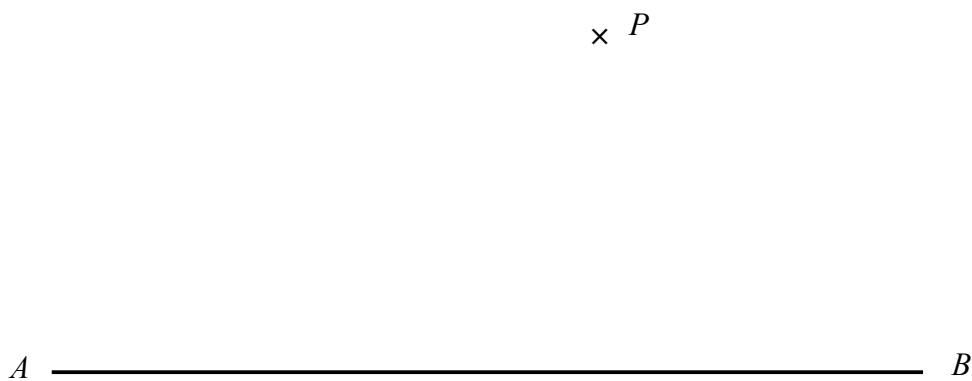
(Total for Question 3 is 3 marks)

- 4 Use ruler and compasses to construct the perpendicular from point C to the line AB .
You must show all your construction lines.



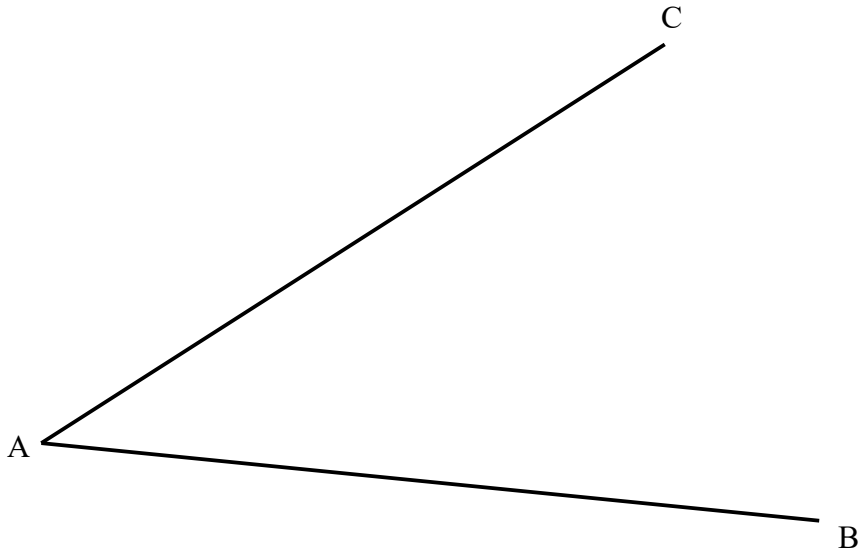
(Total for Question 4 is 2 marks)

- 5 Use ruler and compasses to construct the perpendicular from point P to the line AB .
You must show all your construction lines.



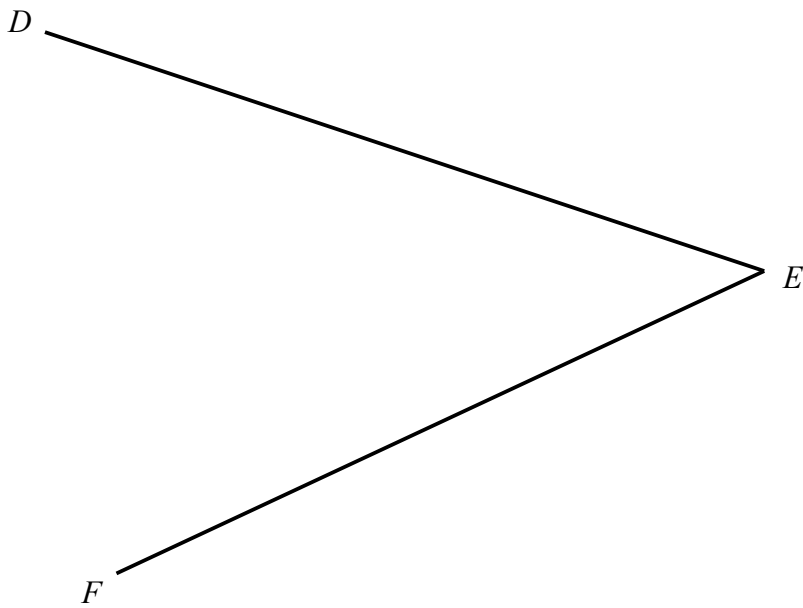
(Total for Question 5 is 2 marks)

- 6 Use ruler and compasses to construct the bisector of angle BAC .
You must show all your construction lines.



(Total for Question 6 is 2 marks)

- 7 Use ruler and compasses to construct the bisector of angle DEF .
You must show all your construction lines.



(Total for Question 7 is 2 marks)

- 8** Use ruler and compasses to construct a perpendicular bisector of the line AB .
You must show all your construction lines.



(Total for Question 8 is 2 marks)

- 9** In the space below, use a ruler and compasses to construct a 30° angle.
You must show all your construction lines.

(Total for Question 9 is 4 marks)

- 10** Here is a scale drawing of a garden.
The scale is 1 cm to 2 m

A tree is going to be planted.
The tree must be more than 4 m from the patio.
The tree must be more than 6 m from the pond.

Shade the region where the tree can be planted.

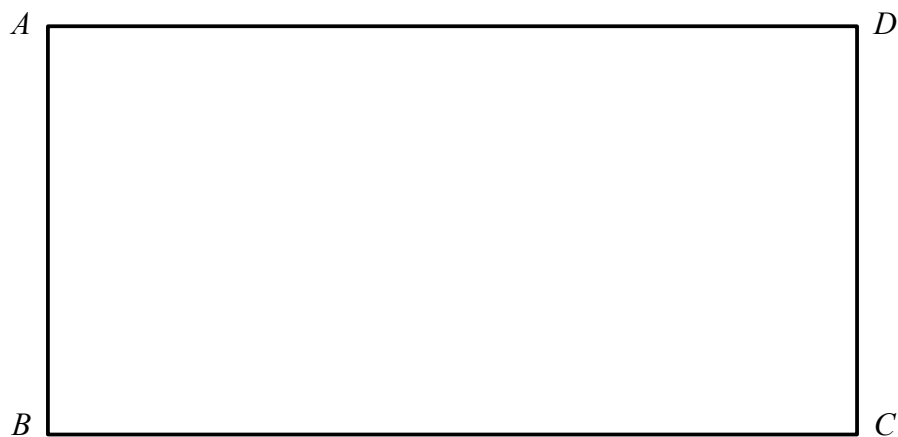


(Total for Question 10 is 2 marks)

- 11** Here is a scale drawing of a room.
The scale is 1 cm to 2 m.

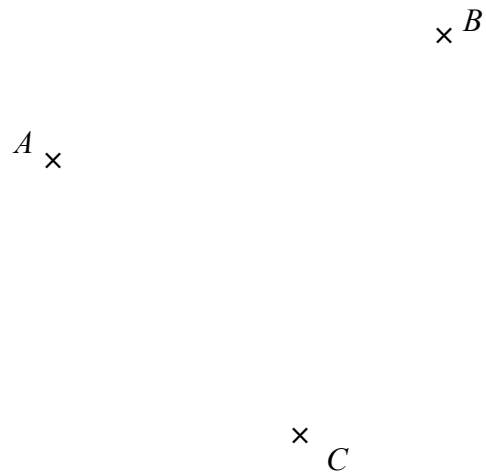
A chair is going to be placed in the room.
The chair must be closer to AB than BC .
The chair must be less than 14 m from D .

Shade the region where the chair can be placed.



(Total for Question 11 is 2 marks)

- 12** A , B and C are three points on a map.
1cm represents 100 metres.



Point P is 300 metres from A .
Point P is equidistant from B and C .

On the map, show the possible positions of P .

(Total for Question 12 is 3 marks)

Name: _____

GCSE (1 – 9)

Bearings

Instructions

- Use **black** ink or ball-point pen.
- Answer all Questions.
- Answer the Questions in the spaces provided
– *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

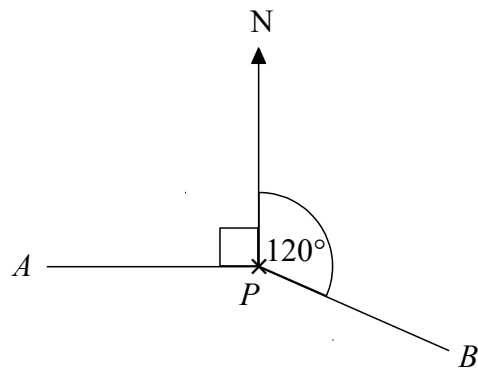
Information

- The marks for each Question are shown in brackets
– *use this as a guide as to how much time to spend on each Question.*

Advice

- Read each Question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every Question.
- Check your answers if you have time at the end

1



(a) Write down the bearing of *B* from *P*.

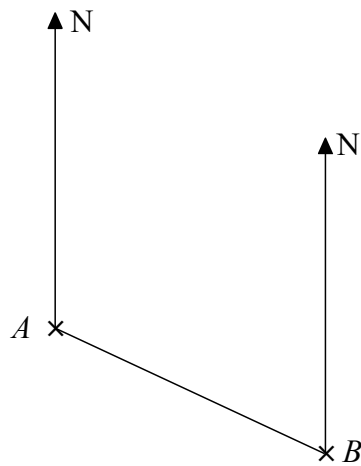
.....
(1)

(b) Work out the bearing of *A* from *P*.

.....
(1)

(Total for Question 1 is 2 marks)

2



(a) Measure the bearing of *B* from *A*.

.....
(1)

(b) Measure the bearing of *A* from *B*.

.....
(1)

(Total for Question 2 is 2 marks)

3 The accurate scale drawing shows the positions of boat *A* and boat *B*.

Boat *C* is on a bearing of 065° from *A*.

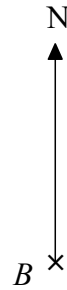
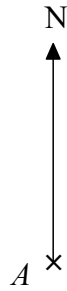
Boat *C* is on a bearing of 315° from *B*.



On the diagram, mark with a cross (x) the position of boat *C* on the diagram.

(Total for Question 3 is 2 marks)

4 The accurate scale drawing shows the positions of boat *A* and boat *B*.



Scale
2 cm represents 1 km

(a) Find the distance from *A* to *B*.

(b) Measure the bearing of *B* from *A*.

..... km

(1)

.....
..... °

(1)

Another boat *C* is 2.5 km from *A* on a bearing of 210°

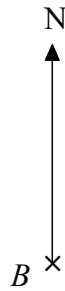
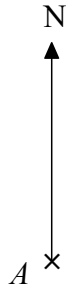
(c) On the diagram, mark the position of boat *C* with a cross (×).

(2)

(Total for Question 4 is 4 marks)

5 The accurate scale drawing shows the positions of point A and point B .

Point C is 8 cm from point A on a bearing of 070°



(a) Find the distance from B to C .

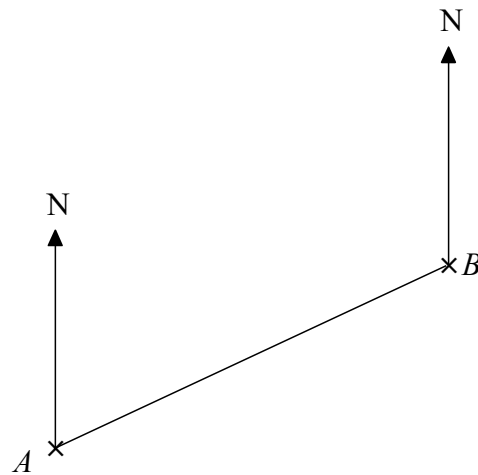
.....cm
(2)

(b) Find the bearing of C from B .

.....
(2)

(Total for Question 5 is 4 marks)

- 6 The accurate scale drawing shows the positions of point A and point B .
1 cm represents 100 m.



- (a) Find the bearing of A from B .

.....
(1)

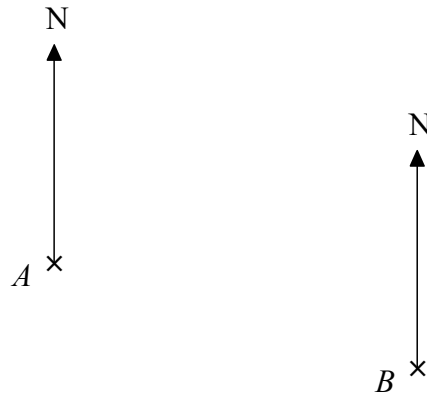
Point C is 450 m from B on a bearing of 150°

- (b) Draw point C , with a cross (\times), on the diagram.

(2)

(Total for Question 6 is 3 marks)

- 7 The accurate scale drawing shows the positions of two towns, town A and town B .
2 cm represents 1 km.



- (a) Find the real distance between town A and town B .

.....
(1)

Town C is 3.2 km from B on a bearing of 255°

- (b) Draw the position of town C , with a cross (\times), on the diagram.

(2)

(Total for Question 7 is 3 marks)

8 Oxford is on a bearing of 330° from Cambridge.

Find the bearing of Cambridge from Oxford.

o

(Total for Question 8 is 2 marks)

9 The bearing of London from Liverpool is 130°

Find the bearing of Liverpool from London.

o

(Total for Question 9 is 2 marks)

Name: _____

GCSE (1 – 9)
Plans and Elevations

Instructions

- Use **black** ink or ball-point pen.
- Answer all questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

Information

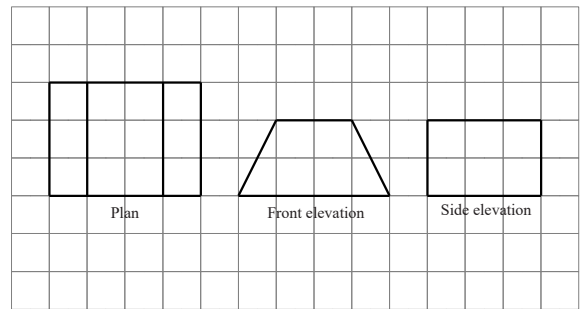
- The marks for each question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end

mathsgenie.co.uk

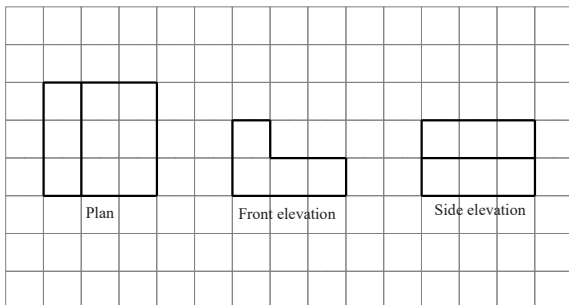
- 1 The diagram shows the plan, front elevation and side elevation of a solid shape, drawn on a centimetre grid.



In the space below, draw a sketch of the solid shape.
Give the dimensions of the solid on your sketch.

(Total for question 1 is 2 marks)

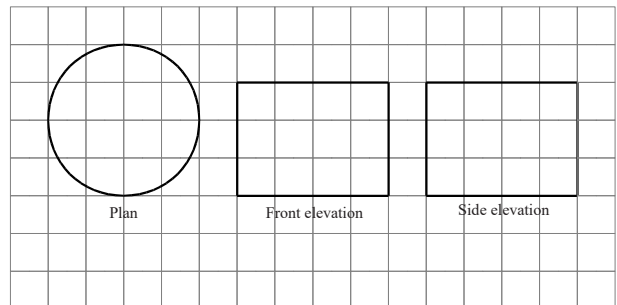
- 2 The diagram shows the plan, front elevation and side elevation of a solid shape, drawn on a centimetre grid.



In the space below, draw a sketch of the solid shape.
Give the dimensions of the solid on your sketch.

(Total for question 2 is 2 marks)

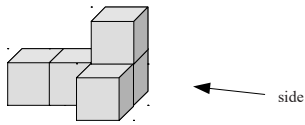
- 3 The diagram shows the plan, front elevation and side elevation of a solid shape, drawn on a centimetre grid.



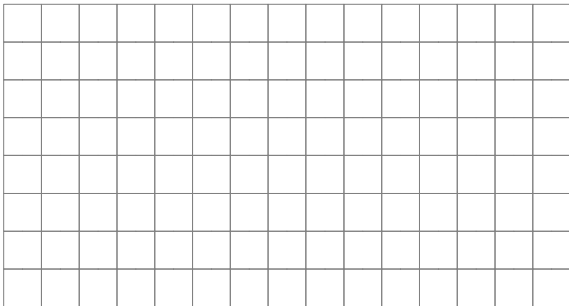
In the space below, draw a sketch of the solid shape.
Give the dimensions of the solid on your sketch.

(Total for question 3 is 2 marks)

4 The diagram shows a solid made from centimetre cubes.

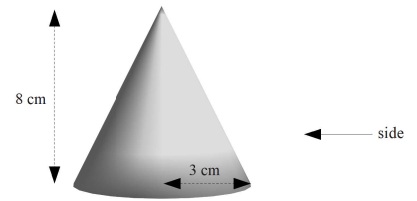


On the centimetre grid below draw the plan and the side elevation for the solid.



(Total for question 4 is 3 marks)

5 The diagram shows a cone with radius 3 cm and perpendicular height of 8 cm

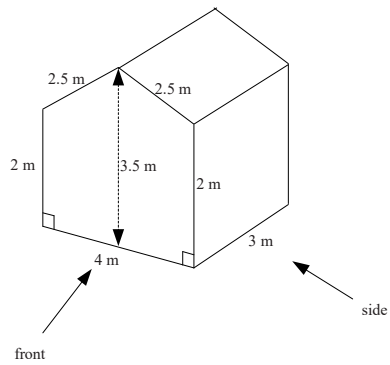


On the centimetre grid below, draw the plan and the side elevation of the cone.

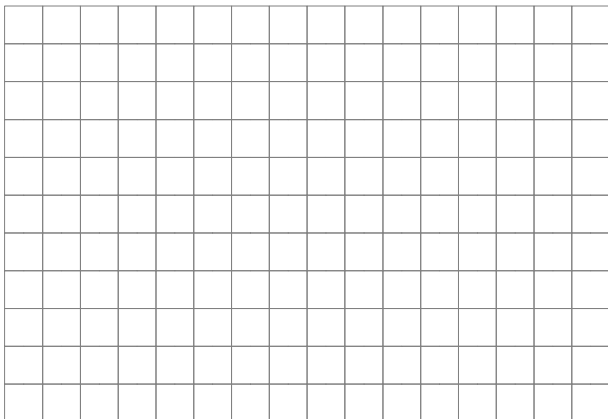


(Total for question 5 is 3 marks)

6 The diagram shows a prism.

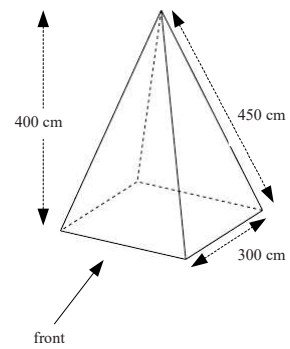


On the centimetre grid below, draw the front elevation and the side elevation of the prism. Use a scale of 2 cm to 1 m.

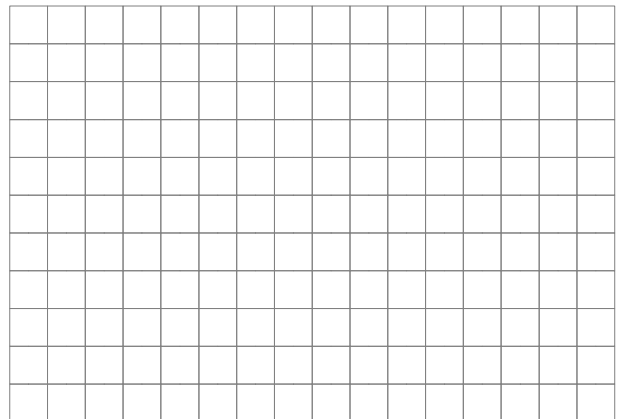


(Total for question 6 is 4 marks)

7 The diagram shows a square based pyramid with a perpendicular height of 400 cm.



On the centimetre grid below, draw the plan and the front elevation of the pyramid. Use a scale of 2 cm to 1 m.



(Total for question 7 is 4 marks)

- 1 The table shows information about the number of points scored in a game.

Points	Frequency
0	9
1	11
2	18
3	7
4	4
5	1

Work out the mean number of points per game.

(Total for question 1 is 3 marks)

- 2 The table shows information about the number of goals scored per game by a football team.

Goals	Frequency
0	10
1	12
2	x
3	7
4 or more	0

The team scored a total of 55 goals.
Find the value of x .

(Total for question 2 is 3 marks)

- 3 The table shows information about the number of goals a team scored in 38 games.

Goals	Frequency
0	7
1	14
2	11
3	6
4 or more	0

- (a) Find the median number of goals scored.
(b) Write down the mode
(c) Work out the total number of goals the team scored in all 38 games.

(Total for question 3 is 4 marks)

- 4 Adam is measuring the heights in cm of his tomato plants.

Height (cm)	Frequency
$140 < h \leq 150$	7
$150 < h \leq 160$	10
$160 < h \leq 170$	15
$170 < h \leq 180$	19
$180 < h \leq 200$	9

- (a) Estimate the mean height.
Give your answer correct to 1 decimal place.
(b) Explain why your answer to part (a) is an estimate.

(Total for question 4 is 4 marks)

- 5 The table below gives information about the time taken for 20 people to run 5 km.

Time (minutes)	Frequency
$15 < t \leq 20$	3
$20 < t \leq 25$	6
$25 < t \leq 30$	7
$30 < t \leq 40$	4

- (a) Find the class interval that contains the median.
 (b) Work out an estimate for the mean time.

(Total for question 5 is 4 marks)

- 6 Michael recorded the maximum temperature every day in September. The table shows information about his results.

Temperature ($^{\circ}\text{C}$)	Frequency
$14 < t \leq 18$	4
$18 < t \leq 20$	10
$20 < t \leq 22$	8
$22 < t \leq 24$	5
$24 < t \leq 28$	3

Calculate an estimate for the mean maximum temperature.

(Total for question 6 is 3 marks)

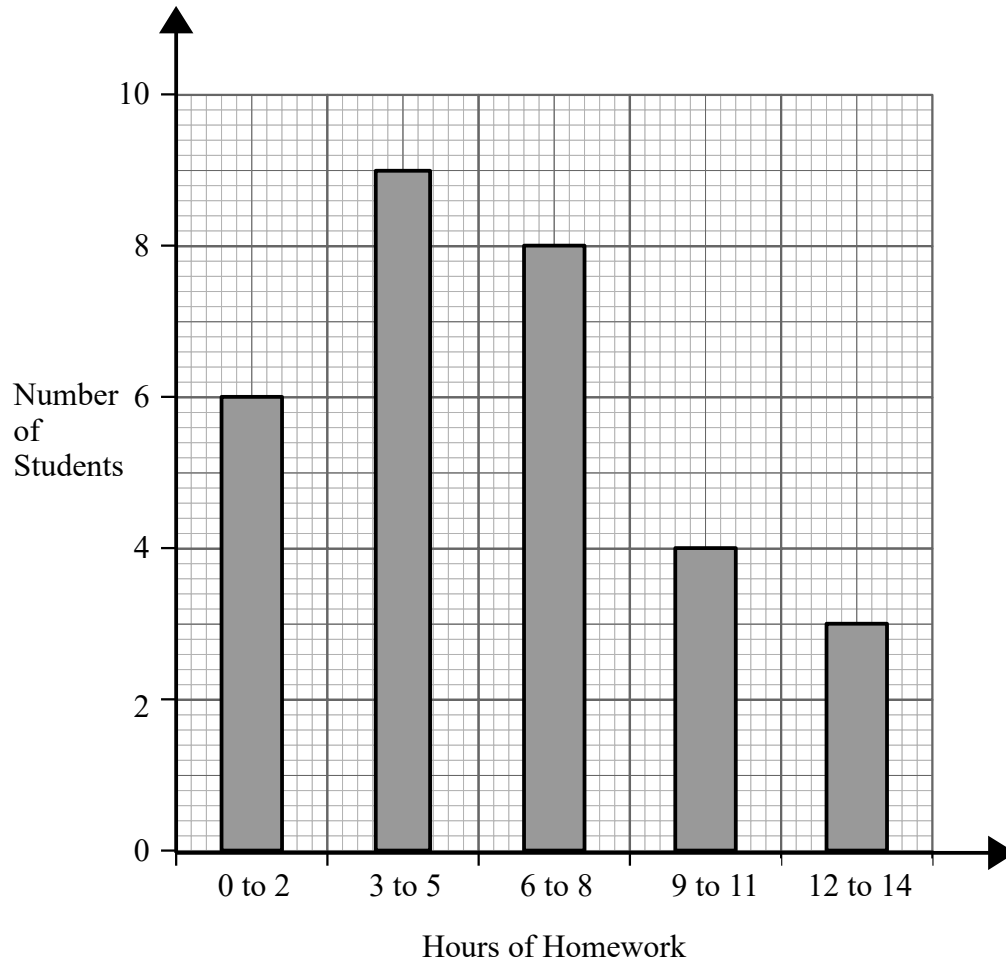
- 7 The frequency table shows the time taken for 100 people to travel to an event.

Time (minutes)	Frequency
$0 < t \leq 10$	14
$10 < t \leq 20$	16
$20 < t \leq 30$	23
$30 < t \leq 40$	29
$40 < t \leq 50$	12
$50 < t \leq 60$	6

- (a) Find the percentage of people that travelled for more than 30 minutes to the event
 (b) Find the class interval that contains the median.
 (c) Find an estimate for the mean time taken for people to travel to the event.

(Total for question 7 is 5 marks)

- 8 The bar chart shows how many hours of homework 30 students did last week.



Calculate an estimate for the mean number of hours of homework.

(Total for question 8 is 3 marks)

Workings Out Page

Workings Out Page

- 1 The probability that a biased dice will land on a 6 is 0.3
The dice is going to be rolled 200 times.
Work out an estimate for the number of times the dice will land on 6.

(2 marks)

- 2 The probability that a sunflower seed will germinate is 0.9
Alan is going to plant 50 sunflower seeds.
Work out an estimate for the number of seeds that will germinate.

(2 marks)

- 3 The probability that Frank scores a penalty is 0.86
Frank is going to take 50 penalties.
Work out an estimate for the number of times Frank will score.

(2 marks)

- 4 The probability that Matt scores a penalty is 0.96
Matt is going to take 25 penalties.
Work out an estimate for the number of times Matt will score.

(2 marks)

- 5 In a bag there are only red counters, blue counters and white counters
A counter is taken at random from the bag.

The table shows the probability of the counter being red and blue.

Colour	Red	Blue	White
Probability	0.5	0.3	

Complete the table to show the probability that counter will be white.

(2 marks)

- 6 In a box there are only black pens, blue pens and green pens
A pen is taken at random from the box.
The table shows the probability of the pen being black and blue.

Colour	Black	Blue	Green
Probability	0.64	0.24	

Complete the table to show the probability that pen will be green.

(2 marks)

- 7 A biased spinner can land on red, blue, yellow and green.
The table shows the probabilities that the spinner will land on red,
blue and yellow.

Colour	Red	Blue	Yellow	Green
Probability	0.25	0.34	0.22	

Complete the table to show the probability that spinner will land on green.

(2 marks)

- 8 In a bag there are only red counters, blue counters and white counters
number of red counters : number of blue counters : number of white counters = 5 : 4 : 3

A counter is taken at random from the bag.

Colour	Red	Blue	White
Probability			

Complete the table to show the probabilities of the counter being red,
blue or white.

(2 marks)

- 9 In a bag there are only black counters, white counters and red counters. A counter is taken at random from the bag.

The table shows the probability of taking a black counter and a white counter.

Colour	Black	White	Red
Probability	$\frac{3}{10}$	$\frac{3}{5}$	

Complete the table to show the probabilities of the counter being red.
(2 marks)

- 10 A biased spinner can land on red, blue, yellow and green. The table shows the probabilities that the spinner will land on red and yellow.

Colour	Red	Blue	Yellow	Green
Probability	0.18		0.26	

The probability of landing on blue is the same as the probability of landing on green.

Complete the table to show the probabilities of spinner landing on blue and green.
(2 marks)

- 11 A biased spinner can land on red, blue, yellow and green. The table shows the probabilities that the spinner will land on red, blue and yellow.

Colour	Red	Blue	Yellow	Green
Probability	0.3	0.25	0.15	

- (a) Complete the table. (2)

Kelly is going to spin the spinner 60 times.

- (b) Work out an estimate for the number of times the spinner will land on red. (2)

(4 marks)

- 12 In a bag there are only red counters, blue counters and white counters. A counter is taken at random from the bag. The table shows the probability of getting a red counter.

Colour	Red	Blue	White
Probability	0.2		

The probability of getting a blue counter is the same as the probability of getting a white counter.

- (a) Complete the table. (2)

There are 18 red counters in the bag.

- (b) Work out the total number of counters in the bag. (2)

(4 marks)

- 13 A biased spinner can land on 1, 2, 3 or 4.
The table shows the probabilities that the spinner will land on 2 and 4.

Number	1	2	3	4
Probability		0.32		0.17

The probability that the spinner will land on 1 is **twice** the probability that the spinner will Land on 3.

- (a) Complete the table. (2)

Johnny is going to spin the spinner 200 times.

- (b) Work out an estimate for the number of times the spinner will land on 2. (2)

(4 marks)

- 14 The table shows the probabilities that a biased dice will land on 1, on 2, on 3, on 5 and on 6.

Number	1	2	3	4	5	6
Probability	0.14	0.2	0.08		0.13	0.21

The dice is rolled 200 times.

Work out an estimate for the number of times the dice will land on 2 or on 4.

(3 marks)

- 15 In a box there are only red pens, blue pens, black pens and green pens.
A pen is taken at random from the box.

The table shows the probabilities that the pen will be red or will be green

Colour	Red	Blue	Black	Green
Probability	0.42			0.14

The probability that the pen will be black is three times the probability that the pen will be blue.

There are 28 green pens in the box.

Work out the number of black pens in the box.

(4 marks)

- 16 In a bag there are only red counters, blue counters, green counters and yellow counters.
A counter is taken at random from the bag.

The table shows the probabilities that the counter will be green or will be yellow.

Colour	Red	Blue	Green	Yellow
Probability			0.35	0.20

The probability that the counter will be red is twice the probability that the counter will be blue.

There are 21 green counters in the bag.

Work out the number of red counters in the bag.

(4 marks)

Workings Out Page

Workings Out Page

Name: _____

GCSE (1 – 9)

Scatter Graphs

Instructions

- Use **black** ink or ball-point pen.
- Answer all Questions.
- Answer the Questions in the spaces provided
– *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

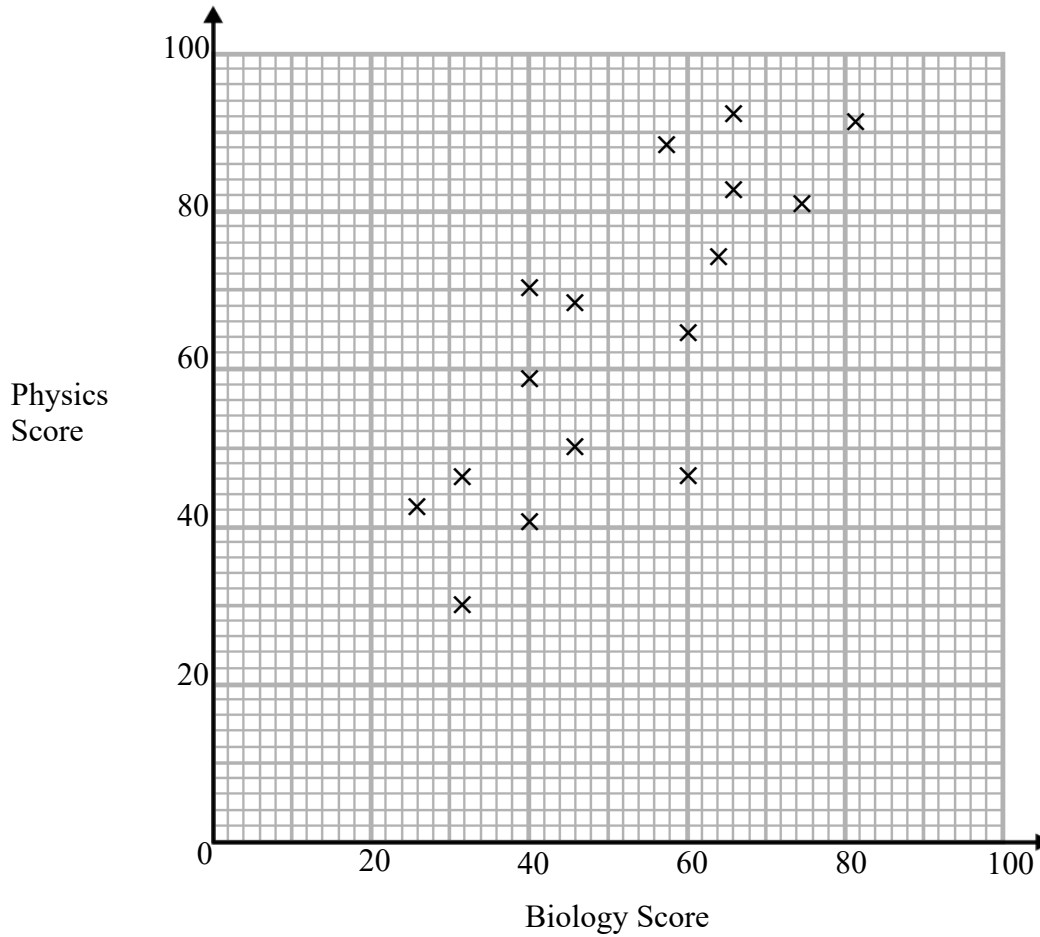
Information

- The marks for each Question are shown in brackets
– *use this as a guide as to how much time to spend on each Question.*

Advice

- Read each Question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every Question.
- Check your answers if you have time at the end

1 The scatter graph shows the scores of 16 students on their Biology and Physics tests.



(a) What type of correlation does the scatter graph show?

.....
(1)

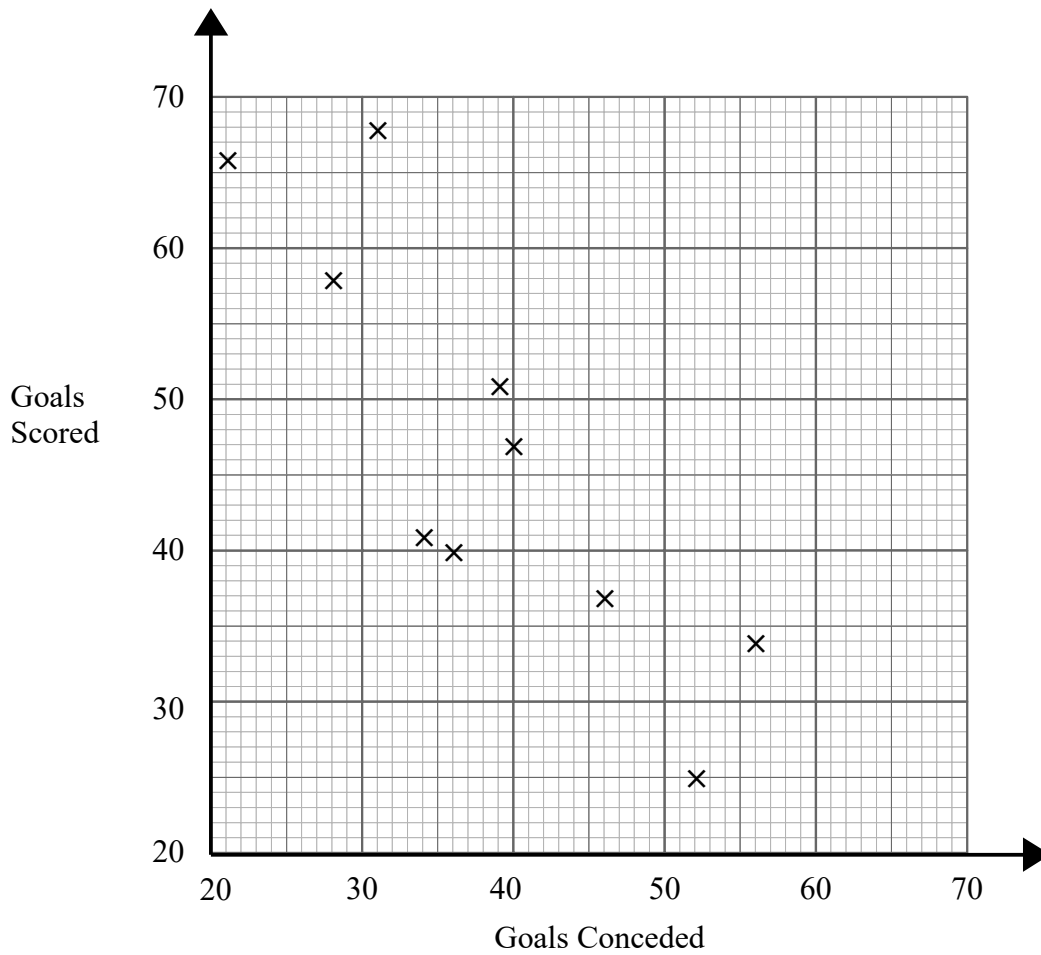
(b) Another student scored 52 marks on their Biology test. Estimate the Physics score for this student.

.....
(2)

(Total for question 1 is 3 marks)

- 2 Gary recorded how many goals 10 football teams scored. He also recorded how many goals they conceded

The information is shown on the scatter graph.



- (a) What type of correlation does the scatter graph show?

.....
(1)

- (b) Another team have scored 44 goals.

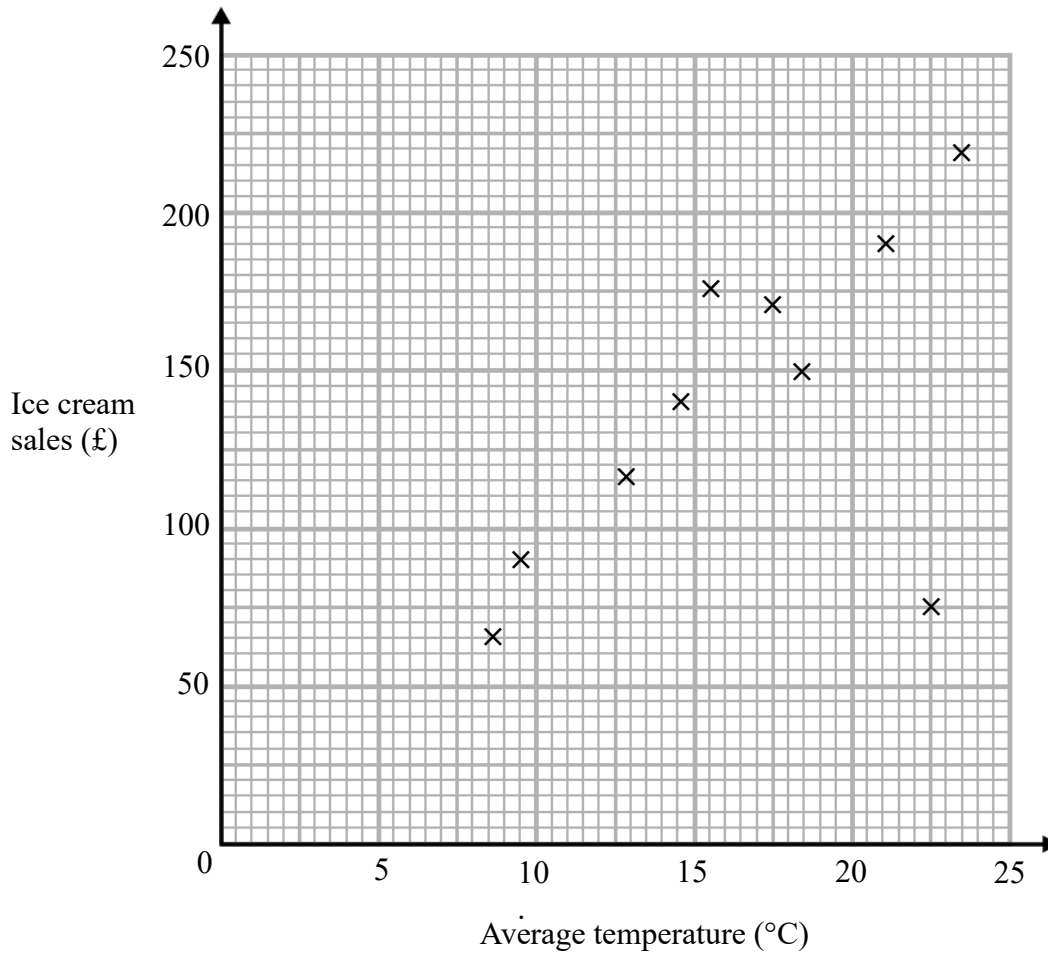
Estimate the number of goals this team has conceded.

.....
(2)

(Total for question 2 is 3 marks)

- 3 The average daytime temperature for 10 days is recorded.
A shop also records its ice cream sales for each of the 10 days.

The scatter graph shows this information.



- (a) What type of correlation does the scatter graph show?

.....
(1)

- (b) One of the points is an outlier. Write down the coordinates for this point.

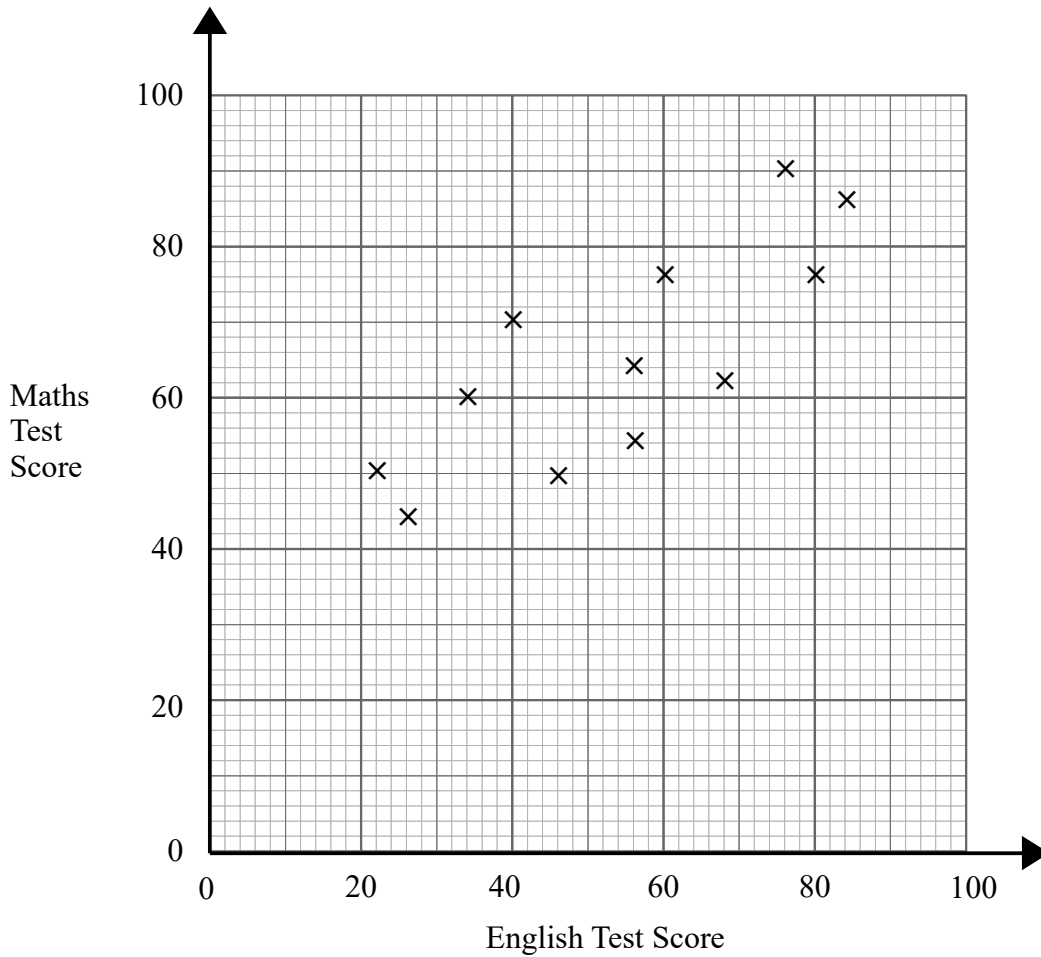
(.....), (.....)
(1)

- (c) On another day the temperature was 12°. Estimate the ice cream sales on this day.

£.....
(2)

(Total for question 3 is 4 marks)

4 The scatter graph shows information about the test scores of some students in Maths and English.



The table shows the test scores of two more students.

Maths Test Score	70	84
English Test Score	64	68

(a) Show this information on the scatter graph. (1)

Another student scored 56 on the maths test.

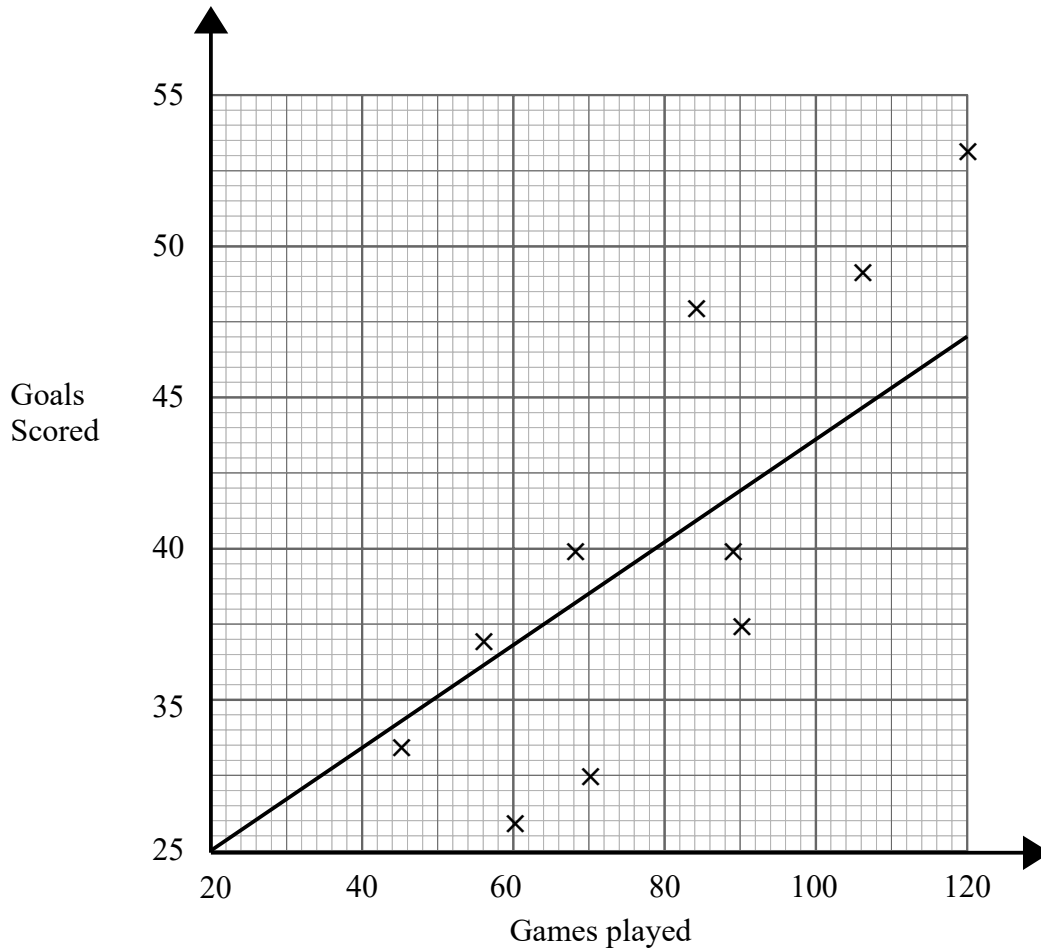
(b) Use the scatter graph to estimate this student's score on the English test.

.....
(2)

(Total for question 4 is 3 marks)

5 Wayne has data about the number of goals 10 football players had scored and the number of games they had played.

He was asked to display the data on a scatter graph.
Here is his answer.



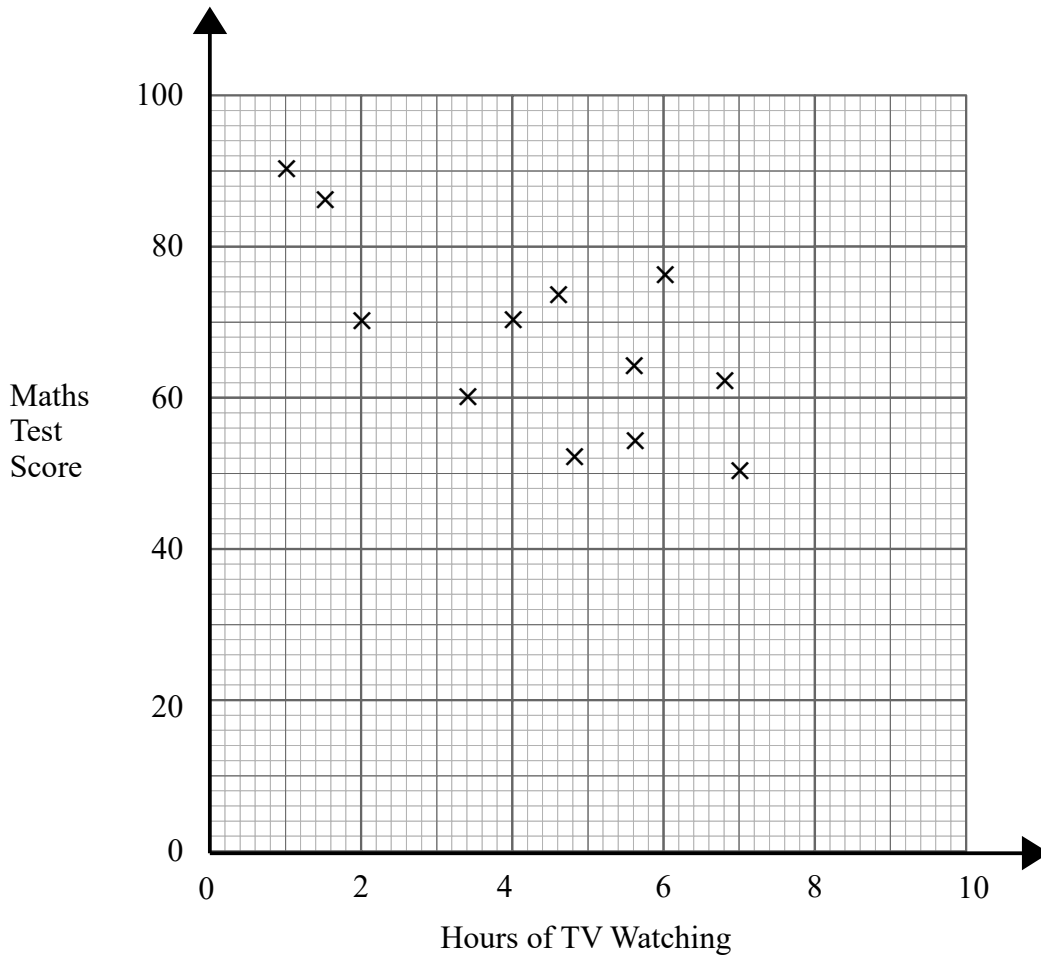
Wayne has plotted the points accurately.

Write down two things that are wrong with his answer.

- 1
.....
- 2
.....

(Total for question 5 is 2 marks)

- 6 The scatter graph shows information about the test scores of some students in Maths and the number of hours they spend watching TV a day.



- (a) What type of correlation does the scatter graph show?

.....
(1)

Billy says,
“If I reduce the amount of TV I watch my Maths test score will improve.”

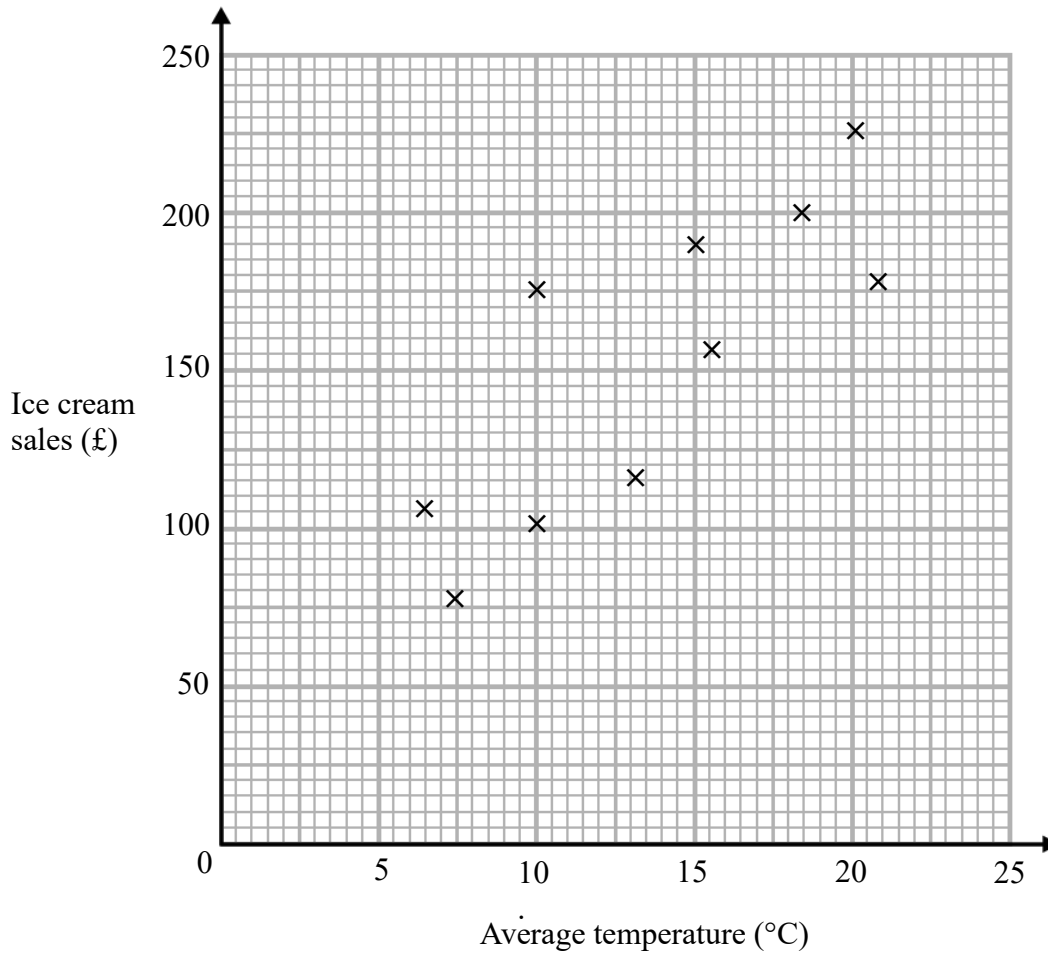
- (b) Comment on what Billy says.

.....
.....
(1)

(Total for question 6 is 3 marks)

- 7 The average daytime temperature for 10 days is recorded.
A shop also records its ice cream sales for each of the 10 days.

The scatter graph shows this information.



- (a) What type of correlation does the scatter graph show?

.....
(1)

- (b) On the 11th day the temperature was 12°. Estimate the ice cream sales on the 11th day.

.....
(2)

- (c) The shop's manager wants to use the scatter graph to predict the ice cream sales for a day with an average temperature of 2°. Comment on the reliability of this prediction.

.....
.....
(1)

(Total for question 7 is 4 marks)