

HOWARTH Henry

9to1_AQA_Nov2017_GCSE_3F

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Your Exam Statistics

Strand	Overall	Number	Algebra	Data	Shape	Ratio
AO1	17 from 30	2 from 5	0 from 4	7 from 8	7 from 10	1 from 3
A02 and 3	37 from 50	7 from 12	16 from 17	7 from 10	7 from 11	0 from 0
Total	54 from 80	9 from 17	16 from 21	14 from 18	14 from 21	1 from 3

Your Pinpoint Topics

- (1) Simple Proportion. MWatch: , Hegarty:
- (2) Surface Area. MWatch: 114, Hegarty:
- (3) Fractions of Amounts and Worded Problems. MW: 72, Hgrty:
- (4) Venn diagrams. MWatch: 127, Hegarty:
- (5) Speed. MWatch: 142, Hegarty:

1) Simple Proportion (Non-Calc): Easier

- 1) CDs cost £6 each
How much will 2 of these CDs cost?

$$£6 \times 2 = £12$$

£ 12 _____

(1 Mark)

- 2) Jon buys 9 packets of sweets.
Each packet costs £3.
How much does Jon pay for all 9 packets of sweets?

$$9 \times £3 = £27$$

£ 27 _____

(1 Mark)

- 3) 2 t-shirts cost £10.
How much will 1 t-shirt cost?

$$£10 \div 2 = £5$$

£ 5 _____

(1 Mark)

- 4) 4 pens weigh 80g.
What is the weight of one pen?

$$80g \div 4 = 20g$$

20 _____ g

(1 Marks)

1) Simple Proportion (Non-Calc): Medium

5) 2 DVDs cost £14

a) Work out the cost of one of these DVDs

$$£14 \div 2 = £7$$

£ 7 _____

(1 Marks)

b) Work out the cost of 3 of these DVDs

$$£7 \times 3$$

£ 21 _____

(1 Mark)

6) The cost of three books is £24.

a) How much would a customer pay for two of these books?

$$24 \div 3 = £8$$

$$£8 \times 2 = £16$$

£ 16 _____

(1 Marks)

b) How much would a customer pay for five of these books?

$$£8 \times 5 = £40$$

£ 40 _____

(1 Mark)

7) The cost of 5 pencils is 55p

How much will 3 of these pencils cost?

$$55p \div 5 = 11p$$

$$11 \times 3 = 33p$$

_____ 33 _____ p

(2 Marks)

1) Simple Proportion (Non-Calc): Harder

- 8) The weight of 4 cakes is 200g
How much will 10 cakes weight?

$$200\text{g} \div 4 = 50\text{g}$$

$$50\text{g} \times 10 = 500\text{g}$$

_____ **500** _____ g

(2 Marks)

- 9) 5 cups of coffee cost £2.50
How much will 1 cup of coffee cost?

$$£2.50 \div 5 = £0.50 \text{ (50p)}$$

£ **0.50** _____

(2 Marks)

- 10) 4 sandwiches cost £5.60
How much will 3 of these sandwiches cost?

$$£5.60 \div 4 = £1.40$$

$$£1.40 \times 3 = £4.20$$

£ **4.20** _____

(3 Marks)

2) Surface Area: Easier

1. The diagram shows a cuboid of dimensions $10\text{cm} \times 8\text{cm} \times 5\text{cm}$.

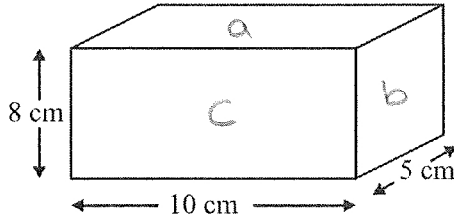


Diagram **NOT** accurately drawn

Work out the total surface area of the cuboid.

State the units with your answer.

3 pairs of sides

(a) Top and Bottom $\rightarrow 10 \times 5 = 50\text{cm}^2$ $\xrightarrow{2 \text{ of them}}$ 100cm^2
 (b) Left and Right $\rightarrow 8 \times 5 = 40\text{cm}^2$ $\rightarrow 80\text{cm}^2$
 (c) Front and Back $\rightarrow 10 \times 8 = 80\text{cm}^2$ $\rightarrow 160\text{cm}^2$

TOTAL	340 cm ²
 340 cm ²

mark for the units

(Total 4 marks)

2. The diagram shows a solid cuboid which is 5 cm by 4 cm by 3 cm.

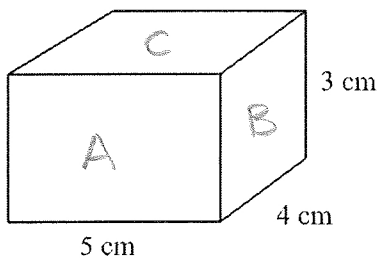


Diagram **NOT** accurately drawn

What is the total surface area of this cuboid?

State the units with your answer.

$A = 5 \times 3 = 15$ $\xrightarrow{2 \text{ of those}}$ 30
 $B = 3 \times 4 = 12$ $\rightarrow 24$
 $C = 4 \times 5 = 20$ $\rightarrow 40$

TOTAL	94
 94 cm ²

mark for units if not given.

(Total 4 marks)

2) Surface Area: Medium

8.

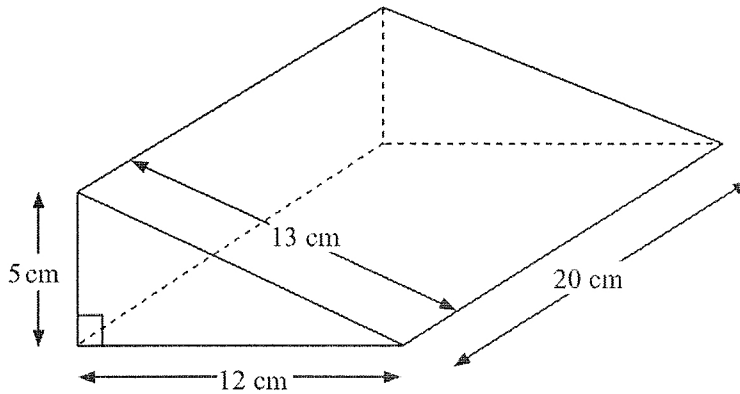


Diagram **NOT** accurately drawn

The diagram shows a right-angled triangular prism.

Work out the surface area of the triangular prism.

$$\text{Front triangle} : \frac{1}{2} \times 5 \times 12 = 30$$

$$\text{Back triangle} : \frac{1}{2} \times 5 \times 12 = 30$$

$$\text{Base} : 12 \times 20 = 240$$

$$\text{Sloping side} : 13 \times 20 = 260$$

$$\text{Other side} : 5 \times 20 = 100$$

$$660$$

..... 660 cm²

2) Surface Area: Harder

9.

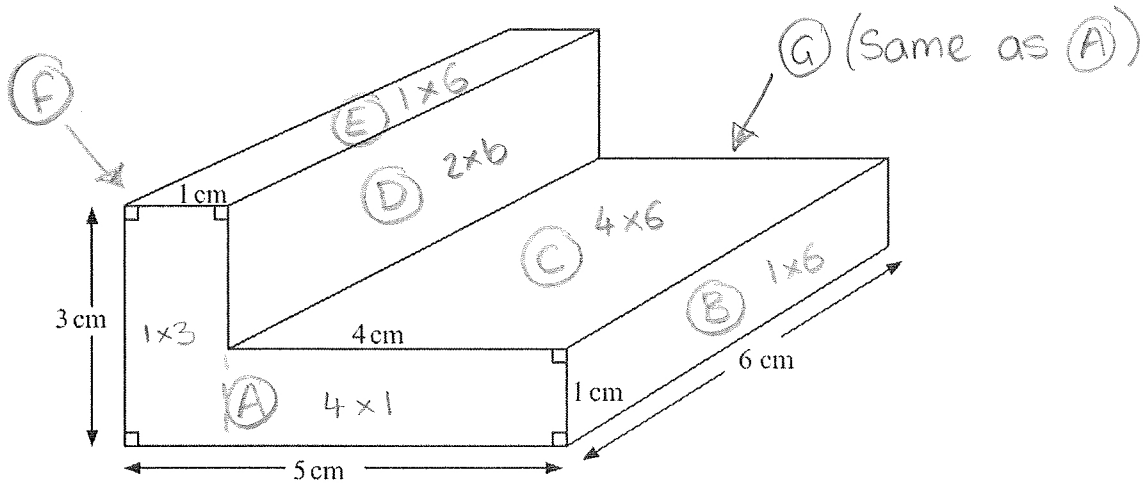


Diagram NOT accurately drawn

Work out the total surface area of the L-shaped prism.
State the units with your answer.

① Label the sides

① → Compound shape so split into 2 and work out areas. Add together to make total.

② → ⑤ All easy rectangles

③ → The one you can't see (3x6)

④ → Same as ①

..... 80 cm²

(Total 4 marks)

$$\textcircled{A} = 7$$

$$\textcircled{B} = 6$$

$$\textcircled{C} = 24$$

$$\textcircled{D} = 12$$

$$\text{TOTAL} = 7 + 6 + 24 + 12 + 6 + 18 + 7$$

$$= 80 \text{ cm}^2$$

3) Fractions of Amounts and Worded Problems (Non-Calc): Easier

1) Work out $\frac{1}{3}$ of 60

$$60 \div 3 = 20$$

20

(1 Mark)

2) Work out $\frac{3}{4}$ of 120

$$120 \div 4 = 30$$

$$30 \times 3 = 90$$

90

(1 Mark)

3) Work out $\frac{4}{7}$ of 91

$$91 \div 7 = 13$$

$$13 \times 4 = 52$$

52

(1 Mark)

4) Work out $\frac{3}{8}$ of 136

$$136 \div 8 = 17$$

$$17 \times 3 = 51$$

51

(1 Mark)

5) Put these quantities in ascending order of size, show your working

$$A: \frac{3}{4} \text{ of } 1200 \quad B: \frac{5}{9} \text{ of } 1440 \quad C: \frac{1}{6} \text{ of } 5100$$

$$A: 1200 \div 4 = 300$$

$$B: 1440 \div 9 = 160$$

$$C: 5100 \div 6 = 850$$

$$300 \times 3 = 900$$

$$160 \times 5 = 800$$

$\frac{5}{9}$ of 1440, $\frac{1}{6}$ of 5100, $\frac{3}{4}$ of 1200

(2 Marks)

3) Fractions of Amounts and Worded Problems (Non-Calc): Medium

- 6) Sarah buys 30 boxes of USB sticks. Each box contains 25 USB sticks. Sarah sells $\frac{5}{6}$ of the USB sticks.

Work out how many USB sticks she sells.

$$\text{Total number of USB sticks: } 30 \times 25 = 750$$

$$750 \div 6 = 125$$

$$125 \times 5 = 625$$

(2 Marks)

- 7) There are 550 people at a theatre. $\frac{3}{11}$ of the people at the theatre are children. A child ticket costs £7.50. An adult ticket costs £15.

Work out how much money the theatre receives.

$$550 \div 11 = 50$$

$$50 \times 3 = 150$$

150 Children, (550 – 150) Adults

$$\text{Money received from child tickets: } 150 \times \text{£}7.50 = \text{£}1125$$

$$\text{Money received from adult tickets: } 400 \times \text{£}15 = \text{£}6000$$

$$\text{£}1125 + \text{£}6000 = \text{£}7125$$

(3 Marks)

3) Fractions of Amounts and Worded Problems (Non-Calc): Harder

- 8) Fiona buys 25 boxes of apples. Each box contains 40 apples. Each box costs £15. On Saturday, she sells $\frac{3}{5}$ of the apples that she bought. She sells each apple for 50p. On Sunday, she sells all the remaining apples at 2 apples for 50p. Work out if Fiona made a profit or a loss assuming no other costs. Justify your answer.

$$\text{Number of apples } 25 \times 40 = 1000$$

$$\text{Cost of apples: } 15 \times 25 = \text{£}375$$

$$\text{Saturday } \frac{3}{5} \text{ of } 1000 = 600 \text{ apples sold}$$

$$\text{Saturday } 600 \times 0.5 = \text{£}300 \text{ made}$$

Sunday 400 apples left

$$400 \div 2 = 200$$

$$200 \times 0.5 = \text{£}100$$

She spent £375 and made £400 so in total £25 profit

(3 Marks)

- 9) James sleeps for one third of a 24 hour period. James plays computer games for one quarter of his waking hours. He also spends $\frac{1}{8}$ of his waking hours watching TV. He plays sport for $\frac{3}{32}$ of his waking hours. How much longer does James spend playing computer games than the combined time of playing sport and watching TV?

$$\frac{1}{3} \text{ of } 24 = 8 \text{ hours sleeping}$$

$$24 - 8 = 16 \text{ waking hours}$$

$$\frac{1}{8} \text{ of } 16 = 2 \text{ hours watching TV}$$

$$\frac{3}{32} \text{ of } 16 = 1.5 \text{ hours playing sport}$$

$$\frac{1}{4} \text{ of } 16 = 4 \text{ hours playing computer games}$$

$$2 + 1.5 = 3.5 \text{ hours}$$

$$4 - 3.5 = 0.5 \text{ hours}$$

30 minutes or half an hour

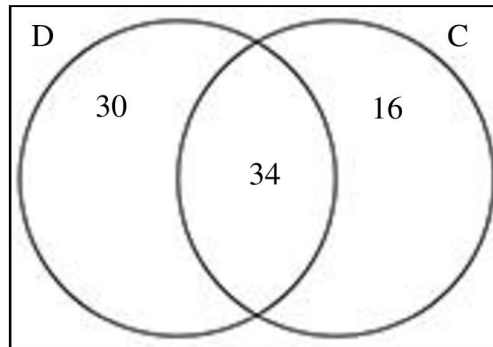
(4 Marks)

4) Venn diagrams: Easier

Solution for Question 1:

Number of people that owned dogs only: $64 - 34 = 30$

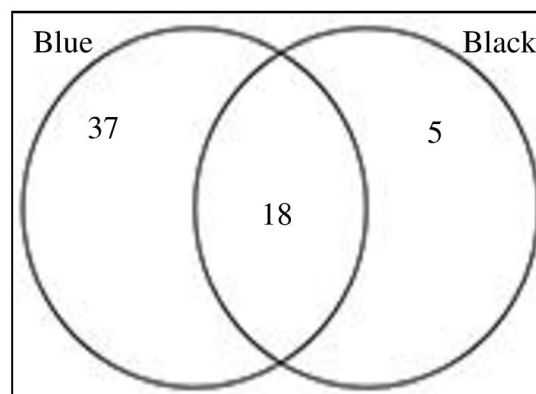
Number of people that owned cats only: $80 - 34 - 30 = 16$



Solution for Question 2:

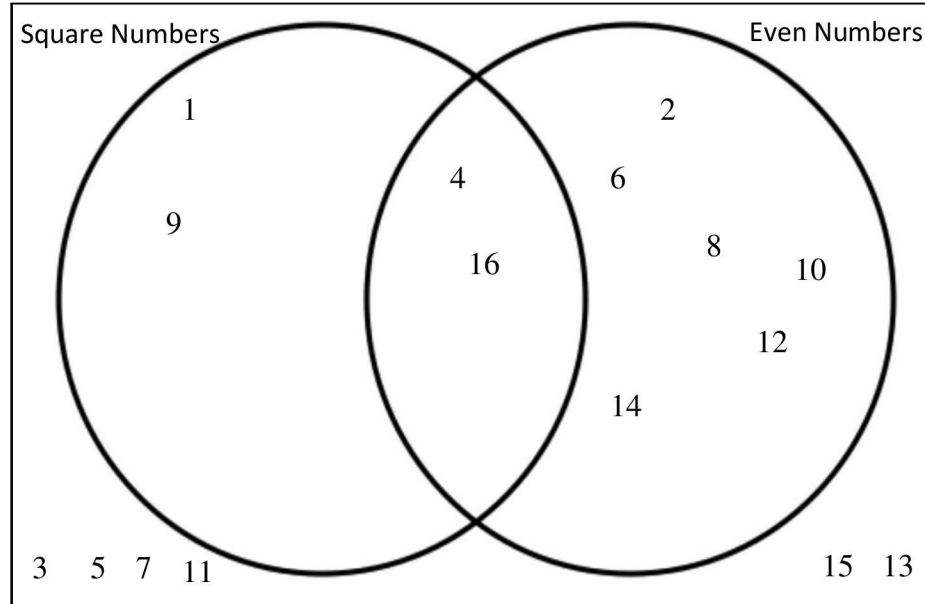
a) Number of people that only had a black pen:
 $60 - 37 - 18 = 5$

b) Probability of a person owning both types of pen:
 $\frac{18}{60} = \frac{3}{10}$



4) Venn diagrams: Medium

Solution for Question 3:



Solution for Question 4:

- a) Tea: $6 + 12 = 18$
 Coffee: $9 + 12 = 21$
 Therefore, False
- b) **no way of knowing**
- c) False

Solution for Question 5:

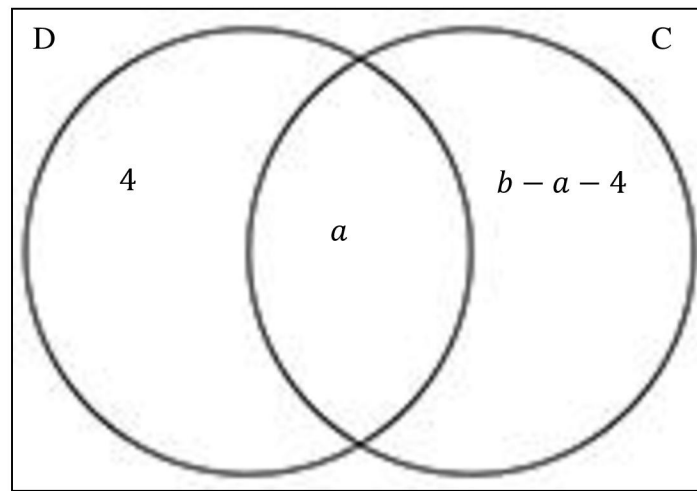
- a)
- i) $A \cap B = A$ and $B = \{9, 15\}$
- ii) $A \cup B = A$ or $B = \{3, 5, 6, 12, 18, 9, 15\}$

4) Venn diagrams: Harder

Solution for Question 6:

Number of people who replied with cats only:

$$b - a - 4$$



5) Speed: Easier

- 1) Pete drove 50 miles in 4 hours
Work out his average speed in miles per hour.

$$\text{speed} = \frac{\text{distance}}{\text{time}} = \frac{50}{4} = \frac{25}{2} = 12.5 \text{ mph}$$

_____ **12.5** miles/hour

(2 Marks)

- 2) Dave cycled 8km in 30 minutes.
Work out Dave's average speed in km/h.

$$30 \text{ mins} = 0.5 \text{ hours}$$

$$\text{speed} = \frac{8}{0.5} = 16 \text{ km/h}$$

_____ **16** Km/h

(3 Marks)

- 3) Jess travels 400km at an average speed of 300 km/h.
How long was she travelling for? Give your answer in minutes.

$$s = \frac{d}{t} \quad \text{so} \quad t = \frac{d}{s} = \frac{400}{300} = \frac{4}{3} = 1\frac{1}{3} \text{ h}$$

$$1 \text{ h} = 60 \text{ mins} \quad \text{so} \quad \frac{1}{3} \text{ h} = 20 \text{ mins}$$

$$\text{so total time} = 60 + 20 = 80 \text{ mins}$$

_____ **80** minutes

(3 Marks)

- 4) Jeff set off for work at 3pm. He arrived at his destination at 5pm.
If Jeff travelled at a constant speed of 24 Km/h, how far did he travel?

$$t = 2 \text{ hours}$$

$$s = \frac{d}{t} \quad \text{so} \quad d = s \times t = 24 \times 2 = 48 \text{ km}$$

_____ **48** Km

(2 Marks)

5) Speed: Medium

Pete needs to catch a ferry.

Pete leaves his home and drives

10 miles towards the motorway

180 miles on the motorway

15 miles from the motorway to the ferry port

Pete

Takes 20 minutes to get to the motorway

Drives at an average speed of 60mph whilst on the motorway

Takes 25 minutes to get from the motorway to the ferry port.

Pete has to arrive at the ferry port no later than midday.

What is the latest time Pete can leave his house?

You must show all your working.

10 miles 180 miles 15 miles
20 minutes 60mph 25 minutes



$$T = D/S$$

$$T = 180/60 = 3 \text{ hours}$$

Total time

3 hours

25 minutes

20 minutes +

3hrs 45 mins

Midday = 12:00pm

3hrs 45 mins

Answer
= 8:15am

5) Speed: Harder

Abigail is on a bus going into the city.

The bus picks her up and drives

4 miles towards a motorway

45 miles on the motorway

6 miles from the motorway to the city bus depot

The bus

Takes 10 minutes to get to the main road

Drives at an average speed of 60mph whilst on the motorway

Takes 15 minutes to get from the motorway to the bus depot

Abigail gets on the bus at 10:19am. What time will she get off the bus?

You must show all your working.

4 miles 10 mins	45 miles 60 mph	6 miles 15 mins
Start	↑	End

$T = D/S$
 $T = 45/60 = \frac{3}{4}$
 $= 45 \text{ mins}$

<u>Total time</u> <u>taken</u>
45
15
10
70 mins
or 1 hr 10 mins

10:19 + 1 hr 10 mins

11:29 am

MCNAB Bayleigh

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Your Exam Statistics

Strand	Overall	Number	Algebra	Data	Shape	Ratio
AO1	12 from 30	2 from 5	2 from 4	4 from 8	3 from 10	1 from 3
A02 and 3	26 from 50	5 from 12	8 from 17	7 from 10	6 from 11	0 from 0
Total	38 from 80	7 from 17	10 from 21	11 from 18	9 from 21	1 from 3

Your Pinpoint Topics

(1) Simple Proportion. MWatch: , Hegarty:

(2) Number machines. MWatch: , Hegarty:

(3) Forming equations from worded questions. MW: 137, Hgrty:

(4) Surface Area. MWatch: 114, Hegarty:

(5) Scales Diagrams. MWatch: NA, Hegarty:

1) Simple Proportion: Easier

- 1) CDs cost £6 each
How much will 2 of these CDs cost?

$$£6 \times 2 = £12$$

£ 12 _____

(1 Mark)

- 2) Jon buys 9 packets of sweets.
Each packet costs £3.
How much does Jon pay for all 9 packets of sweets?

$$9 \times £3 = £27$$

£ 27 _____

(1 Mark)

- 3) 2 t-shirts cost £10.
How much will 1 t-shirt cost?

$$£10 \div 2 = £5$$

£ 5 _____

(1 Mark)

- 4) 4 pens weigh 80g.
What is the weight of one pen?

$$80g \div 4 = 20g$$

_____ 20 _____ g

(1 Marks)

1) Simple Proportion: Medium

5) 2 DVDs cost £14

a) Work out the cost of one of these DVDs

$$£14 \div 2 = £7$$

£ 7 _____

(1 Marks)

b) Work out the cost of 3 of these DVDs

$$£7 \times 3$$

£ 21 _____

(1 Mark)

6) The cost of three books is £24.

a) How much would a customer pay for two of these books?

$$24 \div 3 = £8$$

$$£8 \times 2 = £16$$

£ 16 _____

(1 Marks)

b) How much would a customer pay for five of these books?

$$£8 \times 5 = £40$$

£ 40 _____

(1 Mark)

7) The cost of 5 pencils is 55p

How much will 3 of these pencils cost?

$$55p \div 5 = 11p$$

$$11 \times 3 = 33p$$

_____ 33 _____ p

(2 Marks)

1) Simple Proportion: Harder

- 8) The weight of 4 cakes is 200g
How much will 10 cakes weight?

$$200\text{g} \div 4 = 50\text{g}$$

$$50\text{g} \times 10 = 500\text{g}$$

_____ **500** _____ g

(2 Marks)

- 9) 5 cups of coffee cost £2.50
How much will 1 cup of coffee cost?

$$£2.50 \div 5 = £0.50 \text{ (50p)}$$

£ **0.50** _____

(2 Marks)

- 10) 4 sandwiches cost £5.60
How much will 3 of these sandwiches cost?

$$£5.60 \div 4 = £1.40$$

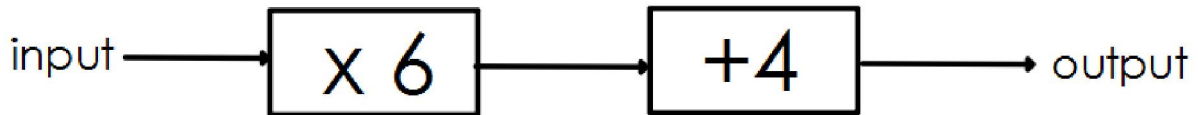
$$£1.40 \times 3 = £4.20$$

£ **4.20** _____

(3 Marks)

2) Number machines: Easier

1) Here is a number machine



a) What is the output when the input is 5?

$$5 \times 6 = 30$$

$$30 + 4 = 34$$

34

.....

(1)

b) What is the input when the output is 40?

$$40 - 4 = 36$$

$$36 \div 6 = 6$$

6

.....

(2)

c) Write an expression for the output when the input is n

$$6n + 4$$

.....

(1)

d) Show that there is an input for which the output is twice the input

$$6n + 4 = n$$

$$5n = -4$$

$$n = -\frac{4}{5}$$

.....

(2)

2) Number machines: Medium

2) Here is a number machine



a) Work out the y when x is -2

$$\begin{aligned} -2 \times 2 &= -4 \\ -4 - 4 &= -8 \end{aligned}$$

$$\begin{aligned} & \dots\dots\dots \\ & \qquad \qquad \qquad -8 \\ & \qquad \qquad \qquad (1) \end{aligned}$$

b) A teacher asks a student to work out x when y is 24

This is the student's method

$$\begin{aligned} 24 \div 2 &= 12 \\ 12 + 4 &= 16 \end{aligned}$$

Comment on the student's method

They have mixed up the order, need to add four first then divide by 2

(1)

c) Write an expression for y in terms of x

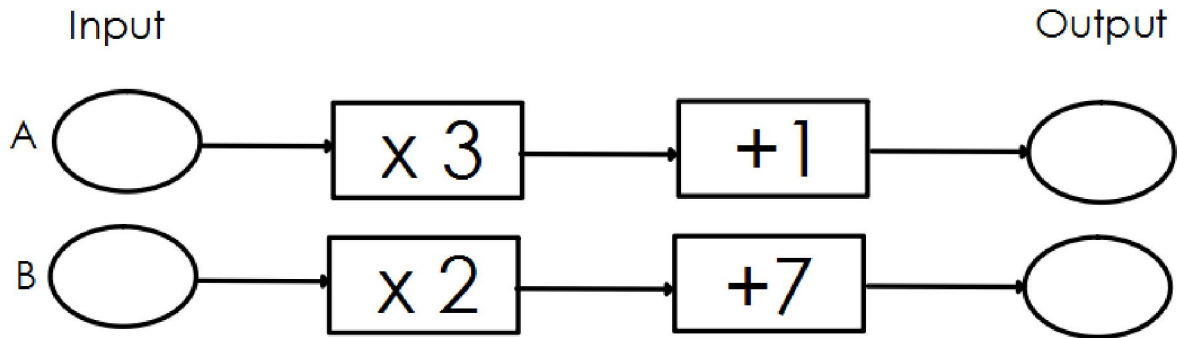
$$y = 2x - 4$$

$$\begin{aligned} & \dots\dots\dots \\ & \qquad \qquad \qquad (1) \end{aligned}$$

(3 Marks)

2) Number machines: Harder

3) Here are two number machines



a) Work out the output if the input is 3 for machine A

$$3 \times 3 = 9$$

$$9 + 1 = 10$$

10

.....
(1)

b) Work out the input if the output is 21 for machine B

$$21 - 7 = 14$$

$$14 \div 2 = 7$$

7

.....
(1)

c) Magdalena puts the same input into machine A and machine B. She gets the same output. Work out her input

$$3x + 1 = 2x + 7$$

$$x = 6$$

$x = 6$

.....
(3)

d) Magdalena puts the same input into machine A and machine B. The output from machine A is twice the output of machine B. Work out her input

$$3x + 1 = 2(2x + 7)$$

$$3x + 1 = 4x + 14$$

$$-13 = x$$

$x = -13$

.....
(3)

(8 Marks)

3) Forming equations from worded questions: Easier

- 1) Tim is 10 years older than Sally. The total of their ages is 100 years. How old is Sally?

$$\begin{aligned}
 S &= \text{Sally's age} \\
 S + (10 + S) &= 100 \\
 2S + 10 &= 100 \\
 2S &= 90 \\
 S &= 45
 \end{aligned}$$

45 years old.

(2 Marks)

- 2) Ahmed has twice as much money as Sharif. In total they have £51. How much money does Ahmed have?

$$\begin{aligned}
 S &= \text{Sharif's money} \\
 S + 2S &= 51 \\
 3S &= 51 \\
 S &= \text{£}17
 \end{aligned}$$

$$\text{Ahmed's} = 17 \times 2 = \text{£}34$$

£34

(2 Marks)

- 3) Tony weighs 8kg more than Dave. Jim is twice as heavy as Dave. Their combined weight is 352kg. Calculate Dave's weight as a percentage of Tony's weight to 2 decimal places?

$$\begin{aligned}
 D &= \text{Dave's weight} \\
 D + 8 + D + 2D &= 352 \\
 4D + 8 &= 352 \\
 4D &= 344 \\
 D &= 86 \text{ kg}
 \end{aligned}$$

$$T = 94 \text{ kg} \quad \therefore \quad 86/94 \times 100 = \underline{91.49\%}$$

(2 Marks)

3) Forming equations from worded questions: Medium

- 4) The length of a rectangle is double its width. Its perimeter is 33cm. How long is its width?

$$w = \text{width}, \quad 2w = \text{length}$$

$$w + w + 2w + 2w = 33$$

$$6w = 33$$

$$w = \frac{33}{6}$$

$$w = \underline{5.5 \text{ cm}}$$

5.5 cm

(2 Marks)

- 5) A bag contains blue, red and orange balls. There are 3 times as many blue balls as there are red balls. There are 5 times as many orange balls as there are blue balls. Dylan picks a ball at random from the bag. What is the probability it is red?

$$r = \text{red balls}, \quad 3r = \text{blue balls}, \quad 15r = \text{orange balls}$$

$$1 : 3 : 15 = 19$$

$$\therefore p(\text{red}) = \frac{1}{19}$$

1/19

(3 Marks)

- 6) Kim is 9 years younger than James. Mary is three times as old as Kim. The sum of their three ages is 64. Find the ratio of Kim's age to Mary's age to James's age.

$$k = \text{kim}, \quad k + 9 = \text{James}, \quad 3k = \text{Mary}$$

$$k + k + 9 + 2k = 64$$

$$5k + 9 = 64$$

$$\frac{5k}{5} = \frac{55}{5}$$

$$k = 11$$

$$\therefore 11 : 33 : 20$$

James = 20
Mary = 33

11 : 33 : 20

(3 Marks)

3) Forming equations from worded questions: Harder

- 7) Tormod bought a perfectly square table but found out it won't fit through his study door. To solve the problem, he reduces its width by 9cm but also extends its length by 9cm. Its new area is 309cm^2

What was the area of his original square table?

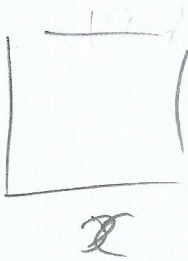
$x = \text{Side of square}$

$$(x-9)(x+9) = 309$$

$$x^2 - 9x + 9x - 81 = 309$$

$$x^2 - 81 = 309$$

$$x^2 = 390$$



$x \leftarrow x^2 = \text{Area of square table,}$
390 cm²

390 cm²

(4 Marks)

4) Surface Area: Easier

1. The diagram shows a cuboid of dimensions $10\text{cm} \times 8\text{cm} \times 5\text{cm}$.

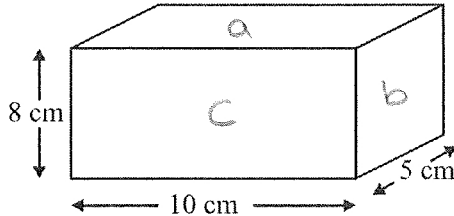


Diagram **NOT** accurately drawn

Work out the total surface area of the cuboid.

State the units with your answer.

3 pairs of sides

(a) Top and Bottom $\rightarrow 10 \times 5 = 50\text{cm}^2$ $\xrightarrow{2 \text{ of them}}$ 100cm^2
 (b) Left and Right $\rightarrow 8 \times 5 = 40\text{cm}^2$ $\rightarrow 80\text{cm}^2$
 (c) Front and Back $\rightarrow 10 \times 8 = 80\text{cm}^2$ $\rightarrow 160\text{cm}^2$

TOTAL	<u>340 cm²</u>
 340 cm ²

mark for the units

(Total 4 marks)

2. The diagram shows a solid cuboid which is 5 cm by 4 cm by 3 cm.

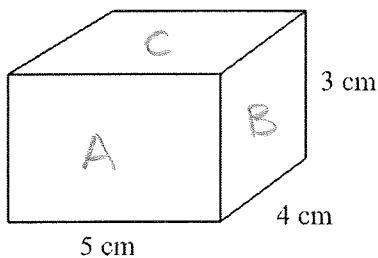


Diagram **NOT** accurately drawn

What is the total surface area of this cuboid?

State the units with your answer.

$A = 5 \times 3 = 15$ $\xrightarrow{2 \text{ of those}}$ 30
 $B = 3 \times 4 = 12$ $\rightarrow 24$
 $C = 4 \times 5 = 20$ $\rightarrow 40$

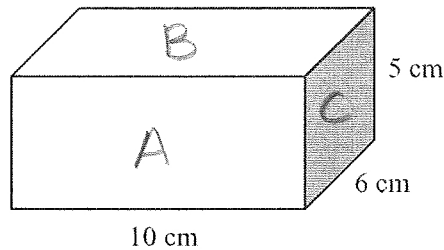
TOTAL	<u>94</u>
 94 cm ²

mark for units if not given.

(Total 4 marks)

4) Surface Area: Medium

3. Here is a cuboid.



$$\begin{array}{r}
 A = 10 \times 5 = 50 \rightarrow 100 \\
 B = 10 \times 6 = 60 \rightarrow 120 \\
 C = 5 \times 6 = 30 \rightarrow 60 \\
 \hline
 280
 \end{array}$$

2 of each

Diagram **NOT** accurately drawn

What is the total surface area of the cuboid?

State the units with your answer.

$$280 \text{ cm}^2$$

(Total 4 marks)

4.

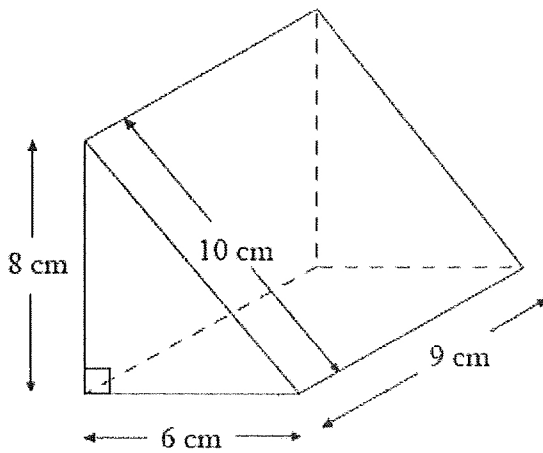


Diagram **NOT** accurately drawn

$$\begin{array}{l}
 2 \times \text{triangle} = \frac{1}{2} \times 8 \times 6 = 24 \rightarrow 48 \\
 \text{slope side} = 10 \times 9 = 90 \\
 \text{base} = 6 \times 9 = 54 \\
 \text{side} = 8 \times 9 = 72
 \end{array}$$

Work out the surface area of the triangular prism.
State the units with your answer.

$$\begin{array}{l}
 \text{TOTAL} = 48 + 90 + 54 + 72 \\
 = 264
 \end{array}$$

$$264 \text{ cm}^2$$

(Total 4 marks)

4) Surface Area: Harder

9.

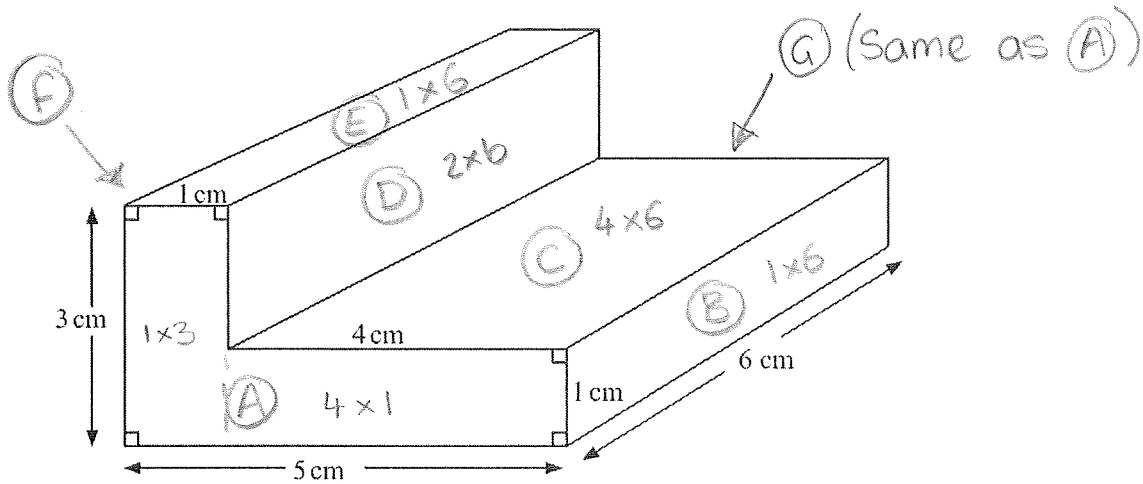


Diagram NOT accurately drawn

Work out the total surface area of the L-shaped prism.
State the units with your answer.

① Label the sides

(A) → Compound shape so split into 2 and work out areas. Add together to make total.

(B) → (E) All easy rectangles

(F) → The one you can't see (3x6)

(G) → Same as (A)

..... 80 cm²

(Total 4 marks)

$$(A) = 7$$

$$(B) = 6$$

$$(C) = 24$$

$$(D) = 12$$

$$\text{TOTAL} = 7 + 6 + 24 + 12 + 6 + 18 + 7$$

$$= 80 \text{ cm}^2$$

5) Scales Diagrams: Easier

- 1) A road map has a scale of 1:20000
On the map a road has a length of 4cm. Work out the actual distance. Give your answer in metres.

$$\begin{aligned}
 &1:20000 \\
 &4:80000 \\
 &1m = 100cm \\
 &80000 \div 100 = 800m
 \end{aligned}$$

800m

(2 Marks)

-
- 2) On a map two points are 7cm apart. The map has a scale of 1:10000. Work out the actual distance. Give your answer in km.

$$\begin{aligned}
 &1:10000 \\
 &7:70000 \\
 &1km = 100000cm \\
 &70000 \div 100000 = 0.7km
 \end{aligned}$$

0.7km

(2 Marks)

-
- 3) A map has a scale of 1cm to 50000cm. Two junctions are 1km apart. Work out how far they are apart on the map. Give your answer in cm.

$$\begin{aligned}
 &1:50000 \\
 &1km = 100000cm \\
 &1:50000 \\
 &2:100000
 \end{aligned}$$

2cm

(2 Marks)

5) Scales Diagrams: Medium

- 4) Kim is making a scale model of a car. The length of the car is 2.4m. She uses a scale of 1cm to 12cm. Work out the length of the scale model of the car. Give your answer in cm.

$$\begin{aligned} 2.4\text{m} &= 240\text{cm} \\ 1 &: 12 \\ 20 &: 240 \end{aligned}$$

20cm

(2 Marks)

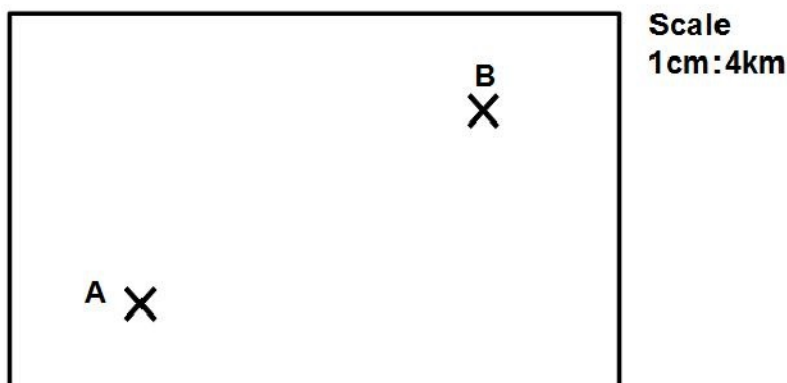
- 5) A model plane has a length of 26cm. The scale of the model is 1:50. Work out the length of the real plane. Give your answer in metres.

$$\begin{aligned} 1 &: 50 \\ 26 &: 1300 \\ 1300 \div 100 &= 13 \end{aligned}$$

13m

(2 Marks)

- 6) The diagram shows the position of two lighthouses.



Work out the actual distance between the lighthouses.

Measures: 3.4 cm (Note: this may be different due to printing)

$$3.4 \times 4 = 13.6 \text{ km}$$

13.6 Km

(2 Marks)

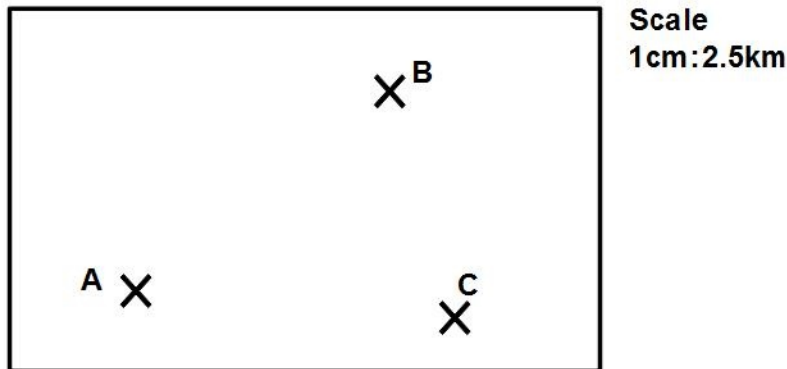
5) Scales Diagrams: Harder

- 7) Ahmed is making a model train. The length of the train is 60m. He uses a scale of 1cm to 30cm. Ahmed says his model should be 2cm. Ahmed is wrong. Give a reason why Ahmed is wrong.

2cm would be 60cm not 60m. 60metres would be 200cm

(1 Mark)

- 8) The diagram below shows three towns, at A, B and C. Sarah drives from town A to town B. Owen drives from town B to town C and then returns to B again. How much further does Owen drive than Sarah?



A to B Measures: 2.3cm (Note: this may be different due to printing)

$$2.3 \times 2.5 = 5.75$$

B to C Measures: 1.9cm (Note: this may be different due to printing)

$$1.9 \times 2.5 =$$

Drives there and back so Owen drives 9.5 km

$$9.5 - 5.75 = 3.75 \text{ km}$$

Owen drives 3.75 km more than Sarah.

(3 Marks)

RILEY Rebecca

9to1_AQA_Nov2017_GCSE_3F

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Your Exam Statistics

Strand	Overall	Number	Algebra	Data	Shape	Ratio
AO1	17 from 30	1 from 5	3 from 4	3 from 8	7 from 10	3 from 3
A02 and 3	31 from 50	6 from 12	12 from 17	7 from 10	6 from 11	0 from 0
Total	48 from 80	7 from 17	15 from 21	10 from 18	13 from 21	3 from 3

Your Pinpoint Topics

- (1) Simple Sytematic Listing. MWatch: 69, Hegarty:
- (2) Number machines. MWatch: , Hegarty:
- (3) Surface Area. MWatch: 114, Hegarty:
- (4) Fractions of Amounts and Worded Problems. MW: 72, Hgrty:
- (5) Venn diagrams. MWatch: 127, Hegarty:

1) Simple Sytematic Listing: Easier

1) Claudia has 3 cards; she lists all the 3 digit numbers she can make.

1 2 3

She lists:

1	2	3
1	3	2
2	1	3
2	3	1
3	2	1
3	1	2

Fill in the missing two combinations

(1 Mark)

2) List all the 2 digit numbers that can be made from these cards

2 1 5

21
 25
 12
 15
 52
 51

(2 Marks)

1) Simple Systematic Listing: Medium

- 3) In a football tournament, teams are put into groups. In one group, there is England, Russia, Slovakia and Wales. In the first stage, each team must play every team once.

List all the matches in the first stage.

England v Russia
Wales v Slovakia

England v Wales
Russia v Slovakia

England v Slovakia
Wales v Russia

(2 Marks)

- 4) Meera is choosing 2 books from the library. She is choosing from a selection of Science fiction, Biography and Thriller. She can choose more than one of the same type.

Write down all the combinations of two books that she could take

Science Fiction, Science Fiction

Science Fiction, Biography

Science Fiction, Thriller

Biography, Biography

Biography, Thriller

Thriller, Thriller

1) Simple Sytematic Listing: Harder

- 5) Andrea arranges these four cards to make a 4 digit number. She uses all the cards each time.



How many different 4 digit numbers can she make that are over 5000?

6135 6513 5316

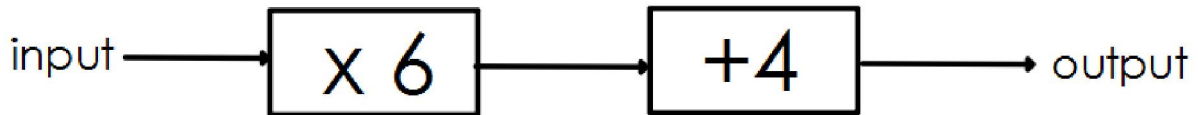
6153 6531 5361

6351 5136 5613

6315 5163 5631

2) Number machines: Easier

1) Here is a number machine



a) What is the output when the input is 5?

$$5 \times 6 = 30$$

$$30 + 4 = 34$$

34

.....

(1)

b) What is the input when the output is 40?

$$40 - 4 = 36$$

$$36 \div 6 = 6$$

6

.....

(2)

c) Write an expression for the output when the input is n

$$6n + 4$$

.....

(1)

d) Show that there is an input for which the output is twice the input

$$6n + 4 = n$$

$$5n = -4$$

$$n = -\frac{4}{5}$$

.....

(2)

2) Number machines: Medium

2) Here is a number machine



a) Work out the y when x is -2

$$\begin{aligned} -2 \times 2 &= -4 \\ -4 - 4 &= -8 \end{aligned}$$

$$\begin{array}{r} \dots\dots\dots \\ -8 \\ (1) \end{array}$$

b) A teacher asks a student to work out x when y is 24

This is the student's method

$$\begin{aligned} 24 \div 2 &= 12 \\ 12 + 4 &= 16 \end{aligned}$$

Comment on the student's method

They have mixed up the order, need to add four first then divide by 2

(1)

c) Write an expression for y in terms of x

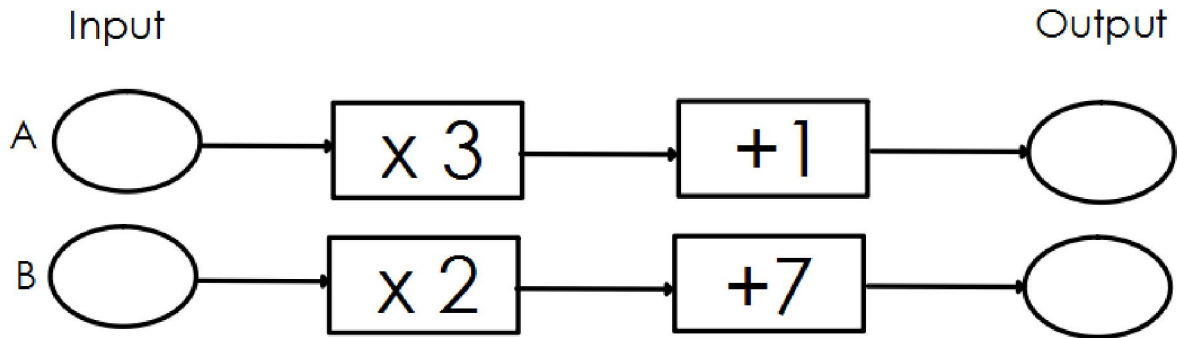
$$y = 2x - 4$$

$$\begin{array}{r} \dots\dots\dots \\ (1) \end{array}$$

(3 Marks)

2) Number machines: Harder

3) Here are two number machines



a) Work out the output if the input is 3 for machine A

$$3 \times 3 = 9$$

$$9 + 1 = 10$$

10

.....
(1)

b) Work out the input if the output is 21 for machine B

$$21 - 7 = 14$$

$$14 \div 2 = 7$$

7

.....
(1)

c) Magdalena puts the same input into machine A and machine B. She gets the same output. Work out her input

$$3x + 1 = 2x + 7$$

$$x = 6$$

$x = 6$

.....
(3)

d) Magdalena puts the same input into machine A and machine B. The output from machine A is twice the output of machine B. Work out her input

$$3x + 1 = 2(2x + 7)$$

$$3x + 1 = 4x + 14$$

$$-13 = x$$

$x = -13$

.....
(3)

(8 Marks)

3) Surface Area: Easier

1. The diagram shows a cuboid of dimensions $10\text{cm} \times 8\text{cm} \times 5\text{cm}$.

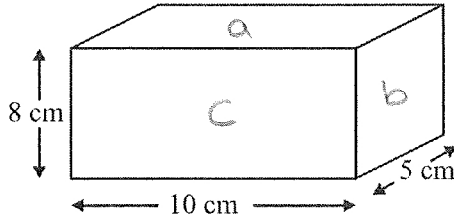


Diagram **NOT** accurately drawn

Work out the total surface area of the cuboid.

State the units with your answer.

3 pairs of sides

(a) Top and Bottom $\rightarrow 10 \times 5 = 50\text{cm}^2$ $\xrightarrow{2 \text{ of them}}$ 100cm^2
 (b) Left and Right $\rightarrow 8 \times 5 = 40\text{cm}^2$ $\rightarrow 80\text{cm}^2$
 (c) Front and Back $\rightarrow 10 \times 8 = 80\text{cm}^2$ $\rightarrow 160\text{cm}^2$

TOTAL	340 cm ²
	340 cm ²

mark for the units

(Total 4 marks)

2. The diagram shows a solid cuboid which is 5 cm by 4 cm by 3 cm.

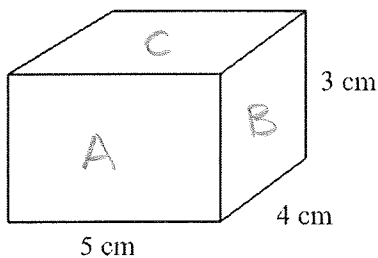


Diagram **NOT** accurately drawn

What is the total surface area of this cuboid?

State the units with your answer.

$A = 5 \times 3 = 15$ $\xrightarrow{2 \text{ of those}}$ 30
 $B = 3 \times 4 = 12$ $\rightarrow 24$
 $C = 4 \times 5 = 20$ $\rightarrow 40$

TOTAL	94
-------	----

mark for units if not given.

(Total 4 marks)

3) Surface Area: Medium

8.

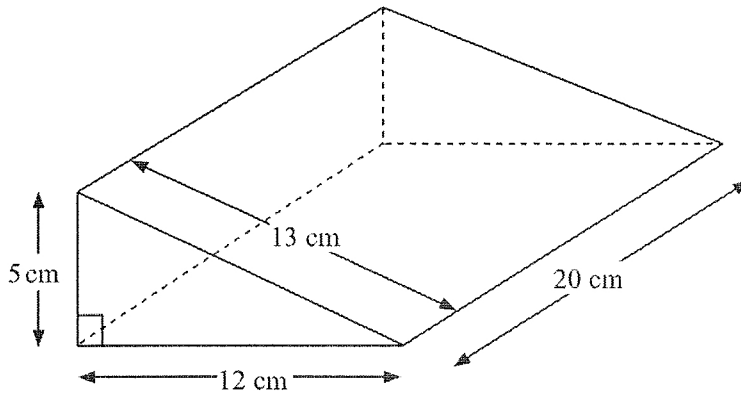


Diagram **NOT** accurately drawn

The diagram shows a right-angled triangular prism.

Work out the surface area of the triangular prism.

$$\text{Front triangle} : \frac{1}{2} \times 5 \times 12 = 30$$

$$\text{Back triangle} : \frac{1}{2} \times 5 \times 12 = 30$$

$$\text{Base} : 12 \times 20 = 240$$

$$\text{Sloping side} : 13 \times 20 = 260$$

$$\text{Other side} : 5 \times 20 = 100$$

$$660$$

..... 660 cm²

3) Surface Area: Harder

9.

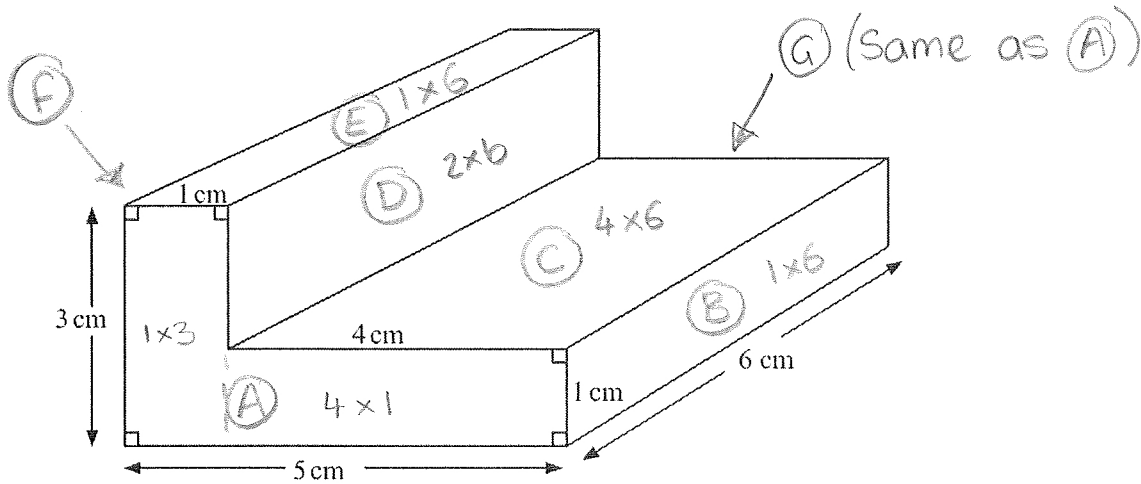


Diagram NOT accurately drawn

Work out the total surface area of the L-shaped prism.
State the units with your answer.

① Label the sides

Ⓐ → Compound shape so split into 2 and work out areas. Add together to make total.

Ⓑ → Ⓔ All easy rectangles

Ⓕ → The one you can't see (3x6)

Ⓖ → Same as Ⓐ

..... 80 cm²

(Total 4 marks)

Ⓐ = 7

Ⓑ = 6

Ⓒ = 24

Ⓓ = 12

TOTAL = 7 + 6 + 24 + 12 + 6 + 18 + 7

= 80 cm²

4) Fractions of Amounts and Worded Problems: Easier

1) Work out $\frac{1}{3}$ of 60

$$60 \div 3 = 20$$

20

(1 Mark)

2) Work out $\frac{3}{4}$ of 120

$$120 \div 4 = 30$$

$$30 \times 3 = 90$$

90

(1 Mark)

3) Work out $\frac{4}{7}$ of 91

$$91 \div 7 = 13$$

$$13 \times 4 = 52$$

52

(1 Mark)

4) Work out $\frac{3}{8}$ of 136

$$136 \div 8 = 17$$

$$17 \times 3 = 51$$

51

(1 Mark)

5) Put these quantities in ascending order of size, show your working

$$A: \frac{3}{4} \text{ of } 1200 \quad B: \frac{5}{9} \text{ of } 1440 \quad C: \frac{1}{6} \text{ of } 5100$$

$$A: 1200 \div 4 = 300$$

$$B: 1440 \div 9 = 160$$

$$C: 5100 \div 6 = 850$$

$$300 \times 3 = 900$$

$$160 \times 5 = 800$$

$\frac{5}{9}$ of 1440, $\frac{1}{6}$ of 5100, $\frac{3}{4}$ of 1200

(2 Marks)

4) Fractions of Amounts and Worded Problems: Medium

- 6) Sarah buys 30 boxes of USB sticks. Each box contains 25 USB sticks. Sarah sells $\frac{5}{6}$ of the USB sticks.

Work out how many USB sticks she sells.

$$\text{Total number of USB sticks: } 30 \times 25 = 750$$

$$750 \div 6 = 125$$

$$125 \times 5 = 625$$

(2 Marks)

- 7) There are 550 people at a theatre. $\frac{3}{11}$ of the people at the theatre are children. A child ticket costs £7.50. An adult ticket costs £15.

Work out how much money the theatre receives.

$$550 \div 11 = 50$$

$$50 \times 3 = 150$$

150 Children, (550 – 150) Adults

$$\text{Money received from child tickets: } 150 \times \text{£}7.50 = \text{£}1125$$

$$\text{Money received from adult tickets: } 400 \times \text{£}15 = \text{£}6000$$

$$\text{£}1125 + \text{£}6000 = \text{£}7125$$

(3 Marks)

4) Fractions of Amounts and Worded Problems: Harder

- 8) Fiona buys 25 boxes of apples. Each box contains 40 apples. Each box costs £15. On Saturday, she sells $\frac{3}{5}$ of the apples that she bought. She sells each apple for 50p. On Sunday, she sells all the remaining apples at 2 apples for 50p. Work out if Fiona made a profit or a loss assuming no other costs. Justify your answer.

$$\text{Number of apples } 25 \times 40 = 1000$$

$$\text{Cost of apples: } 15 \times 25 = \text{£}375$$

$$\text{Saturday } \frac{3}{5} \text{ of } 1000 = 600 \text{ apples sold}$$

$$\text{Saturday } 600 \times 0.5 = \text{£}300 \text{ made}$$

Sunday 400 apples left

$$400 \div 2 = 200$$

$$200 \times 0.5 = \text{£}100$$

She spent £375 and made £400 so in total £25 profit

(3 Marks)

- 9) James sleeps for one third of a 24 hour period. James plays computer games for one quarter of his waking hours. He also spends $\frac{1}{8}$ of his waking hours watching TV. He plays sport for $\frac{3}{32}$ of his waking hours. How much longer does James spend playing computer games than the combined time of playing sport and watching TV?

$$\frac{1}{3} \text{ of } 24 = 8 \text{ hours sleeping}$$

$$24 - 8 = 16 \text{ waking hours}$$

$$\frac{1}{8} \text{ of } 16 = 2 \text{ hours watching TV}$$

$$\frac{3}{32} \text{ of } 16 = 1.5 \text{ hours playing sport}$$

$$\frac{1}{4} \text{ of } 16 = 4 \text{ hours playing computer games}$$

$$2 + 1.5 = 3.5 \text{ hours}$$

$$4 - 3.5 = 0.5 \text{ hours}$$

30 minutes or half an hour

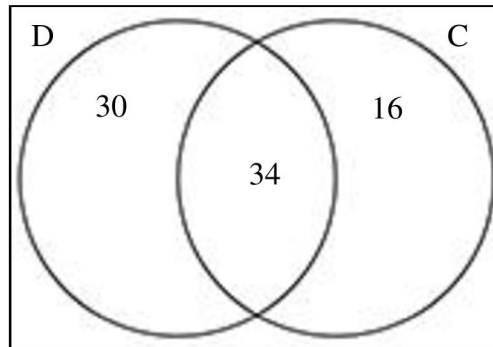
(4 Marks)

5) Venn diagrams: Easier

Solution for Question 1:

Number of people that owned dogs only: $64 - 34 = 30$

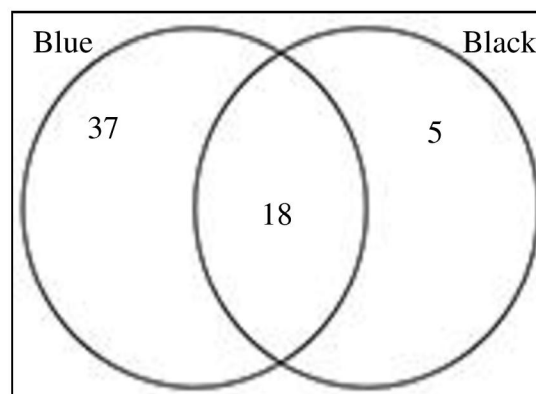
Number of people that owned cats only: $80 - 34 - 30 = 16$



Solution for Question 2:

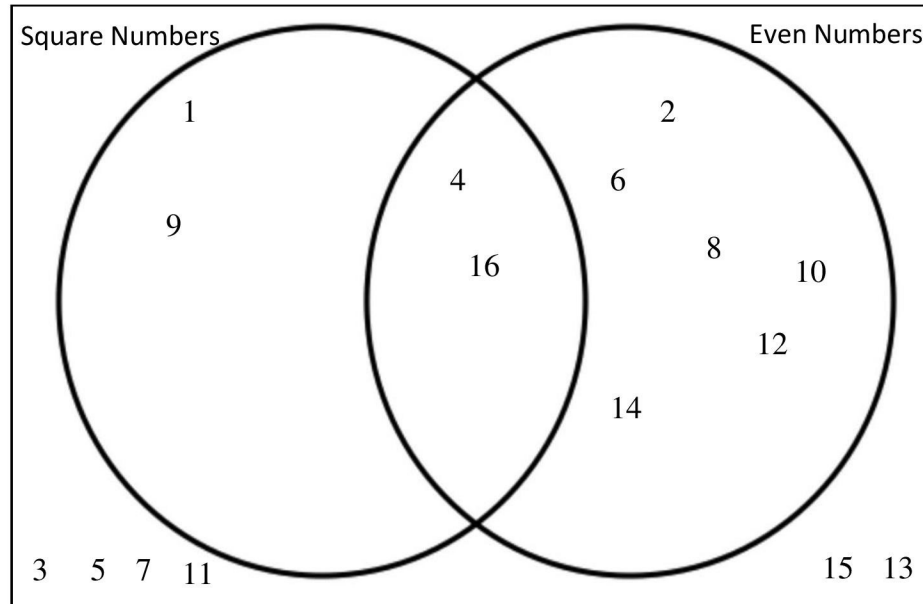
a) Number of people that only had a black pen:
 $60 - 37 - 18 = 5$

b) Probability of a person owning both types of pen:
 $\frac{18}{60} = \frac{3}{10}$



5) Venn diagrams: Medium

Solution for Question 3:



Solution for Question 4:

- a) Tea: $6 + 12 = 18$
 Coffee: $9 + 12 = 21$
 Therefore, False
- b) **no way of knowing**
- c) False

Solution for Question 5:

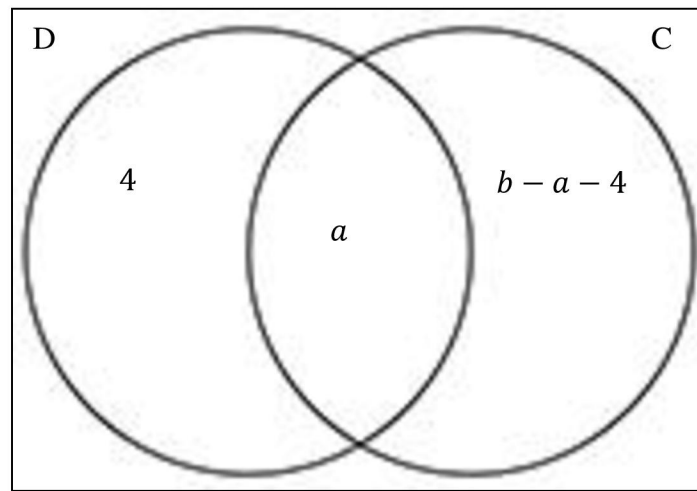
- a)
- i) $A \cap B = A$ and $B = \{9, 15\}$
- ii) $A \cup B = A$ or $B = \{3, 5, 6, 12, 18, 9, 15\}$

5) Venn diagrams: Harder

Solution for Question 6:

Number of people who replied with cats only:

$$b - a - 4$$



WARBURTON Lottie

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Your Exam Statistics

Strand	Overall	Number	Algebra	Data	Shape	Ratio
AO1	14 from 30	1 from 5	0 from 4	6 from 8	4 from 10	3 from 3
A02 and 3	32 from 50	8 from 12	12 from 17	5 from 10	7 from 11	0 from 0
Total	46 from 80	9 from 17	12 from 21	11 from 18	11 from 21	3 from 3

Your Pinpoint Topics

- (1) Surface Area. MWatch: 114, Hegarty:
- (2) Venn diagrams. MWatch: 127, Hegarty:
- (3) Speed. MWatch: 142, Hegarty:
- (4) Angles in Triangles and Quadrilaterals. MW: 121, Hgrty:
- (5) Frequency trees. MWatch: 57, Hegarty:

1) Surface Area: Easier

1. The diagram shows a cuboid of dimensions 10cm × 8cm × 5cm.

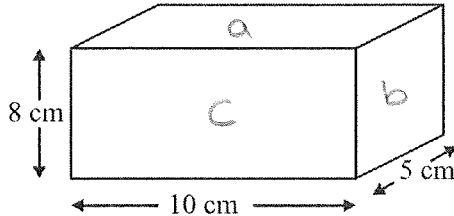


Diagram **NOT** accurately drawn

Work out the total surface area of the cuboid.

State the units with your answer.

3 pairs of sides

(a) Top and Bottom $\rightarrow 10 \times 5 = 50 \text{ cm}^2$ $\xrightarrow{2 \text{ of them}}$ 100 cm^2
 (b) Left and Right $\rightarrow 8 \times 5 = 40 \text{ cm}^2$ $\rightarrow 80 \text{ cm}^2$
 (c) Front and Back $\rightarrow 10 \times 8 = 80 \text{ cm}^2$ $\rightarrow 160 \text{ cm}^2$

TOTAL	340 cm ²
	340 cm ²

mark for the units

(Total 4 marks)

2. The diagram shows a solid cuboid which is 5 cm by 4 cm by 3 cm.

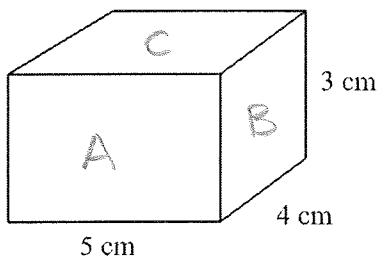


Diagram **NOT** accurately drawn

What is the total surface area of this cuboid?

State the units with your answer.

$A = 5 \times 3 = 15$ $\xrightarrow{2 \text{ of those}}$ 30
 $B = 3 \times 4 = 12$ $\rightarrow 24$
 $C = 4 \times 5 = 20$ $\rightarrow 40$

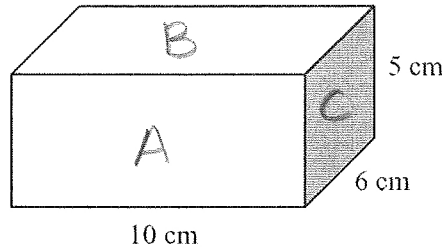
TOTAL	94
-------	----

mark for units if not given.

(Total 4 marks)

1) Surface Area: Medium

3. Here is a cuboid.



$$\begin{array}{r}
 A = 10 \times 5 = 50 \rightarrow 100 \\
 B = 10 \times 6 = 60 \rightarrow 120 \\
 C = 5 \times 6 = 30 \rightarrow 60 \\
 \hline
 280
 \end{array}$$

2 of each

Diagram **NOT** accurately drawn

What is the total surface area of the cuboid?

State the units with your answer.

.....
 280 cm^2

(Total 4 marks)

4.

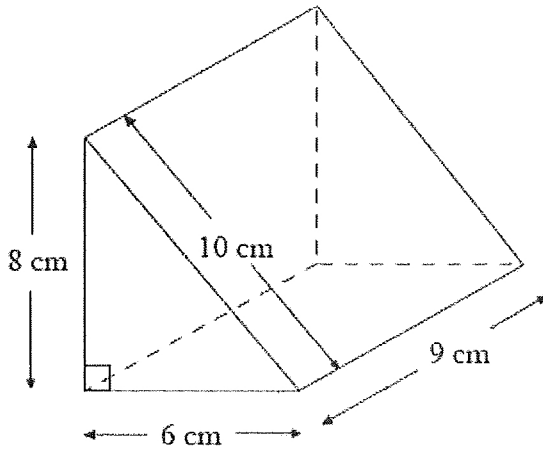


Diagram **NOT** accurately drawn

$$\begin{array}{l}
 2 \times \text{triangle} = \frac{1}{2} \times 8 \times 6 = 24 \rightarrow 48 \\
 \text{slope side} = 10 \times 9 = 90 \\
 \text{base} = 6 \times 9 = 54 \\
 \text{side} = 8 \times 9 = 72
 \end{array}$$

Work out the surface area of the triangular prism.
 State the units with your answer.

$$\begin{array}{l}
 \text{TOTAL} = 48 + 90 + 54 + 72 \\
 = 264
 \end{array}$$

.....
 264 cm^2

(Total 4 marks)

1) Surface Area: Harder

9.

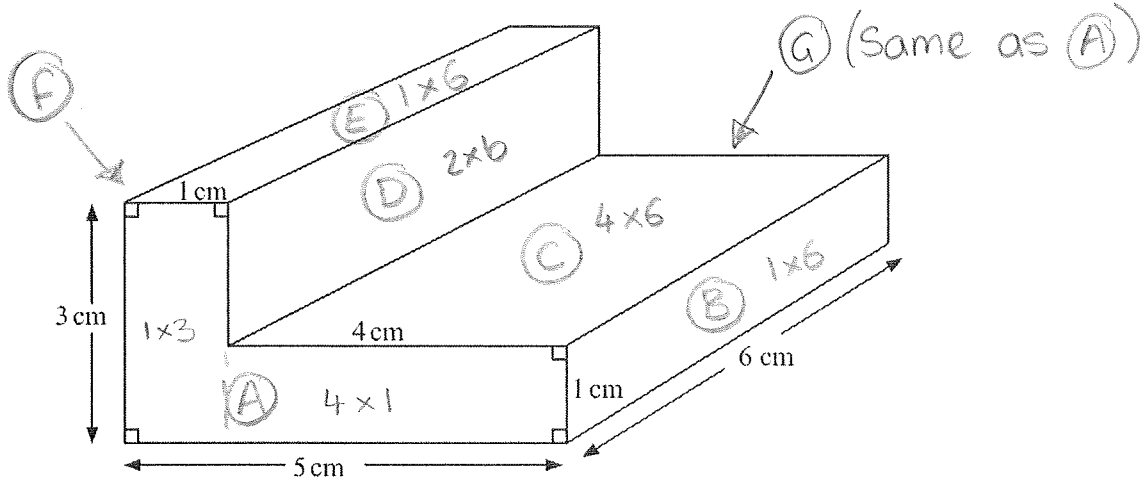


Diagram NOT accurately drawn

Work out the total surface area of the L-shaped prism.
State the units with your answer.

① Label the sides

Ⓐ → Compound shape so split into 2 and work out areas. Add together to make total.

Ⓑ → Ⓔ All easy rectangles

Ⓕ → The one you can't see (3x6)

Ⓖ → Same as Ⓐ

..... 80 cm²

(Total 4 marks)

Ⓐ = 7

Ⓑ = 6

Ⓒ = 24

Ⓓ = 12

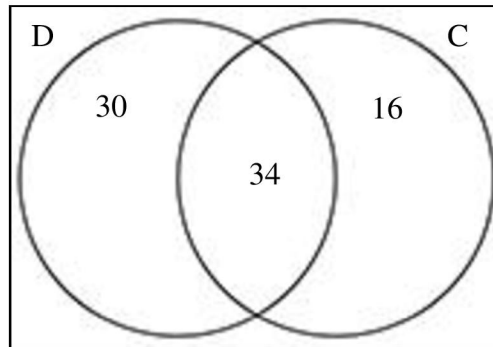
TOTAL = 7 + 6 + 24 + 12 + 6 + 18 + 7
= 80 cm²

2) Venn diagrams: Easier

Solution for Question 1:

Number of people that owned dogs only: $64 - 34 = 30$

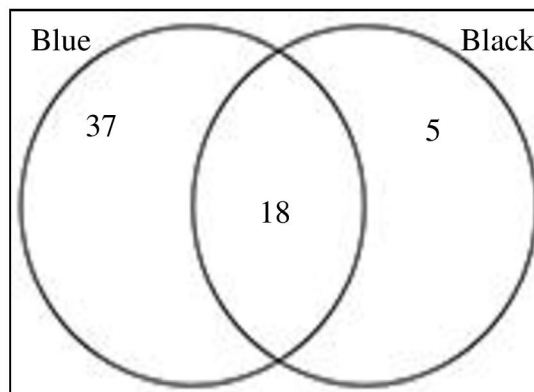
Number of people that owned cats only: $80 - 34 - 30 = 16$



Solution for Question 2:

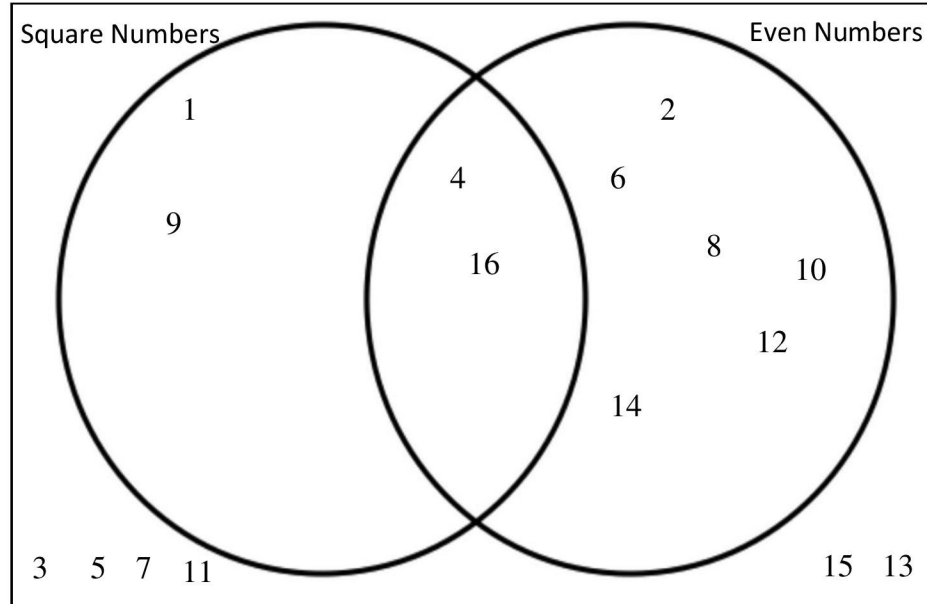
a) Number of people that only had a black pen:
 $60 - 37 - 18 = 5$

b) Probability of a person owning both types of pen:
 $\frac{18}{60} = \frac{3}{10}$



2) Venn diagrams: Medium

Solution for Question 3:



Solution for Question 4:

- a) Tea: $6 + 12 = 18$
 Coffee: $9 + 12 = 21$
 Therefore, False
- b) **no way of knowing**
- c) False

Solution for Question 5:

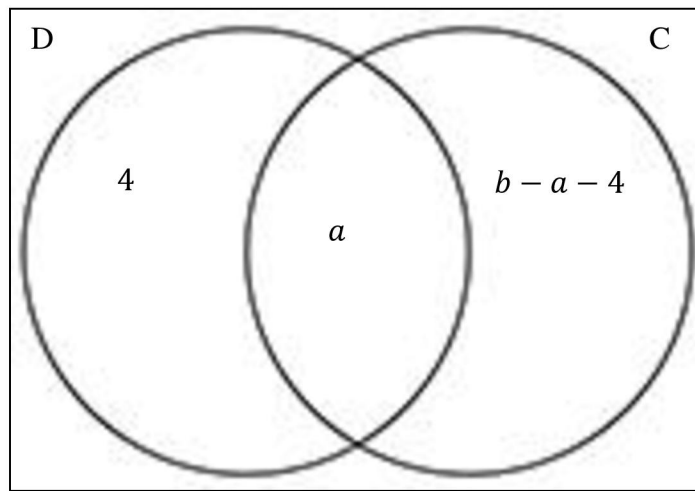
- a)
- i) $A \cap B = A$ and $B = \{9, 15\}$
- ii) $A \cup B = A$ or $B = \{3, 5, 6, 12, 18, 9, 15\}$

2) Venn diagrams: Harder

Solution for Question 6:

Number of people who replied with cats only:

$$b - a - 4$$



3) Speed: Easier

- 1) Pete drove 50 miles in 4 hours
Work out his average speed in miles per hour.

$$\text{speed} = \frac{\text{distance}}{\text{time}} = \frac{50}{4} = \frac{25}{2} = 12.5 \text{ mph}$$

_____ **12.5** _____ miles/hour

(2 Marks)

- 2) Dave cycled 8km in 30 minutes.
Work out Dave's average speed in km/h.

$$30 \text{ mins} = 0.5 \text{ hours}$$

$$\text{speed} = \frac{8}{0.5} = 16 \text{ km/h}$$

_____ **16** _____ Km/h

(3 Marks)

- 3) Jess travels 400km at an average speed of 300 km/h.
How long was she travelling for? Give your answer in minutes.

$$s = \frac{d}{t} \quad \text{so} \quad t = \frac{d}{s} = \frac{400}{300} = \frac{4}{3} = 1\frac{1}{3} \text{ h}$$

$$1 \text{ h} = 60 \text{ mins} \quad \text{so} \quad \frac{1}{3} \text{ h} = 20 \text{ mins}$$

$$\text{so total time} = 60 + 20 = 80 \text{ mins}$$

_____ **80** _____ minutes

(3 Marks)

- 4) Jeff set off for work at 3pm. He arrived at his destination at 5pm.
If Jeff travelled at a constant speed of 24 Km/h, how far did he travel?

$$t = 2 \text{ hours}$$

$$s = \frac{d}{t} \quad \text{so} \quad d = s \times t = 24 \times 2 = 48 \text{ km}$$

_____ **48** _____ Km

(2 Marks)

3) Speed: Medium

Pete needs to catch a ferry.

Pete leaves his home and drives

- 10 miles towards the motorway
- 180 miles on the motorway
- 15 miles from the motorway to the ferry port

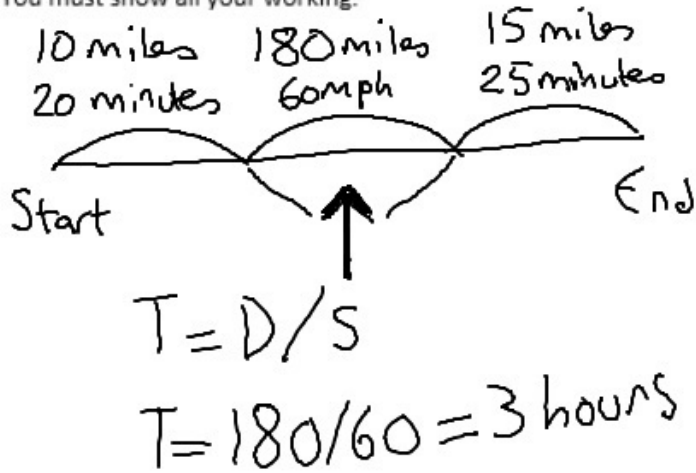
Pete

- Takes 20 minutes to get to the motorway
- Drives at an average speed of 60mph whilst on the motorway
- Takes 25 minutes to get from the motorway to the ferry port.

Pete has to arrive at the ferry port no later than midday.

What is the latest time Pete can leave his house?

You must show all your working.



<p style="text-align: center;"><u>Total time</u></p> <p style="text-align: center;">3 hours</p> <p style="text-align: center;">25 minutes</p> <p style="text-align: center;">20 minutes +</p> <hr style="border: 0.5px solid black;"/> <p style="text-align: center;">3hrs 45 mins</p> <hr style="border: 0.5px solid black;"/> <p style="text-align: center;">Midday = 12:00pm</p> <hr style="border: 0.5px solid black;"/> <p style="text-align: center;">3hrs 45 mins</p>
--

Answer
= 8:15am

3) Speed: Harder

Abigail is on a bus going into the city.

The bus picks her up and drives

4 miles towards a motorway

45 miles on the motorway

6 miles from the motorway to the city bus depot

The bus

Takes 10 minutes to get to the main road

Drives at an average speed of 60mph whilst on the motorway

Takes 15 minutes to get from the motorway to the bus depot

Abigail gets on the bus at 10:19am. What time will she get off the bus?

You must show all your working.

4 miles 45 miles 6 miles
10 mins 60mph 15 mins

Start \ \ / / End
 \ \ / /
 ↑

$$T = D/S$$

$$T = 45/60 = \frac{3}{4}$$

$$= 45 \text{ mins}$$

Total time taken

45

15

10

70 mins

or 1hr 10mins

10:19 + 1hr 10mins

11:29am

4) Angles in Triangles and Quadrilaterals: Easier

1.

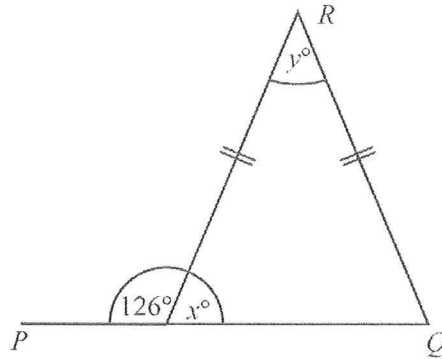


Diagram NOT accurately drawn

PQ is a straight line.

(a) Work out the size of the angle marked x° .

$$180 - 126 = 54$$

..... 54°

(1)

(b) (i) Work out the size of the angle marked y° .

$$180 - (2 \times 54) = 72$$

..... 72°

(ii) Give reasons for your answer.

- Angles in a triangle add up to 180.

- Base angles are equal in an isosceles triangle

(3)
(4 marks)

2.

$$\begin{array}{r} 120 \\ + 140 \\ 58 \\ \hline 318 \end{array}$$

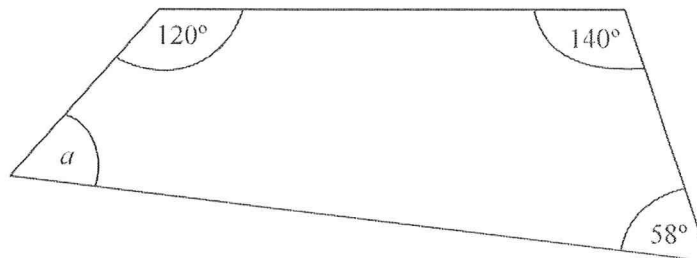


Diagram NOT accurately drawn

Work out the size of the angle a .

$$360 - 318 = 42$$

..... 42°

(2 marks)

4) Angles in Triangles and Quadrilaterals: Medium

3.

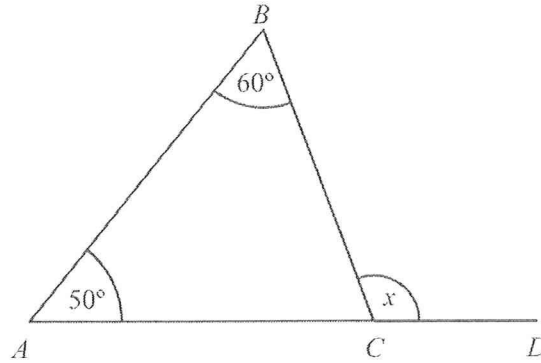


Diagram **NOT** accurately drawn

In the diagram, ABC is a triangle.
 ACD is a straight line.
 Angle $CAB = 50^\circ$.
 Angle $ABC = 60^\circ$.

Work out the size of the angle marked x .

$$50 + 60 = 110$$

$$180 - 110 = 70 \text{ (Triangle)}$$

$$180 - 70 = 110 \text{ (Straight line)}$$

$$\dots\dots\dots 110 \dots\dots\dots^\circ$$

(2 marks)

4.

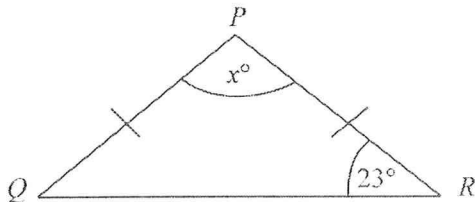


Diagram **NOT** accurately drawn

PQR is an isosceles triangle.

$PQ = PR$.
 Angle $R = 23^\circ$.

Work out the value of x .

$$180 - (2 \times 23) = 134$$

$$x = \dots\dots\dots 134 \dots\dots\dots$$

(2 marks)

4) Angles in Triangles and Quadrilaterals: Harder

13.

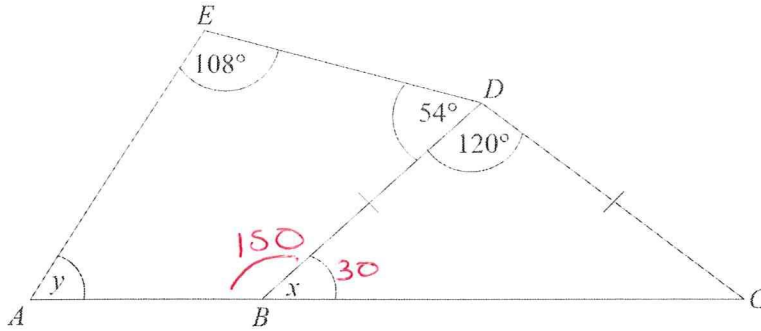


Diagram NOT accurately drawn

In the diagram, ABC is a straight line and $BD = CD$.

(a) Work out the size of angle x .

$$180 - 120 = 60$$

$$60 \div 2 = 30$$

..... 30 °

(2)

(b) Work out the size of angle y .

$$180 - 30 = 150$$

$$\begin{array}{r} 150 \\ + 54 \\ \hline 108 \\ \hline 312 \end{array}$$

$$360 - 312 = 48$$

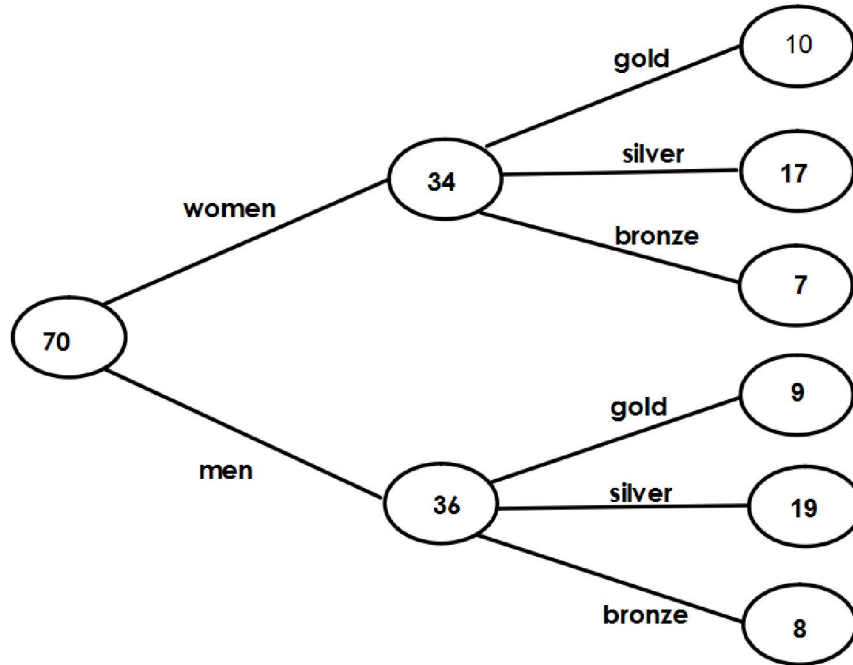
..... 48 °

(3)

(5 marks)

5) Frequency trees: Easier

1) The frequency tree below shows the results of an athletics competition.



a) How many women received medals in the competition?

34

(1 Mark)

b) How many gold medals were awarded to men?

9

(1 Mark)

c) How many people won medals in the competition?

70

(1 Mark)

d) How many bronze medals were awarded?

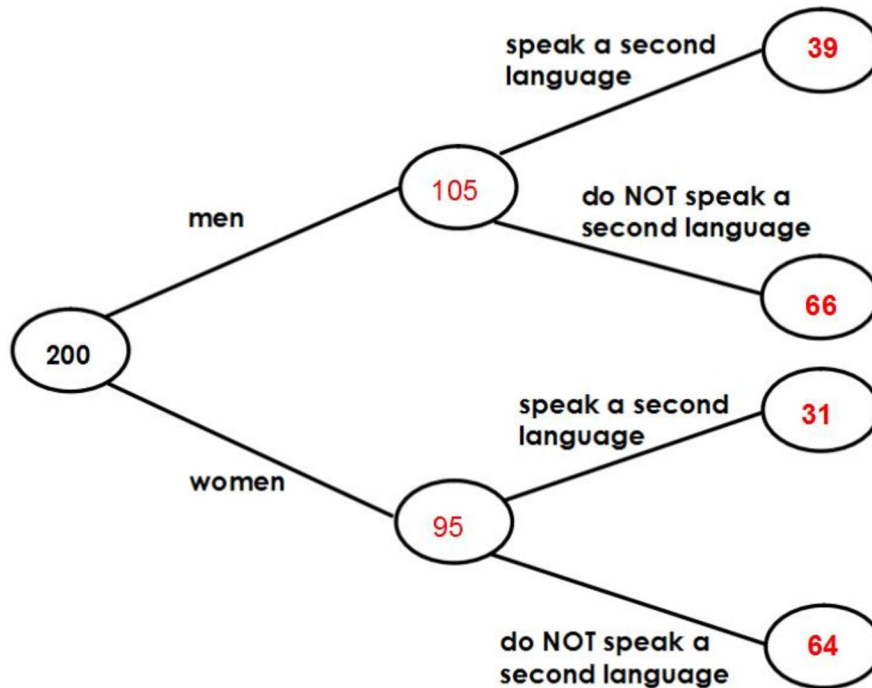
$7+8=15$

15

(1 Mark)

5) Frequency trees: Medium

- 2) In an office, there are 200 employees. 105 are men. Employees are asked if they speak a second language. 70 employees say they speak a second language. 31 women speak a second language. Fill in the frequency tree.



(3 marks)

- b) A woman is chosen at random. Use your frequency tree to write down the probability that she speaks a second language.

$$\frac{31}{95}$$

(1 Mark)

- c) An employee is chosen at random. Use your frequency tree to write down the probability that they do not speak a second language.

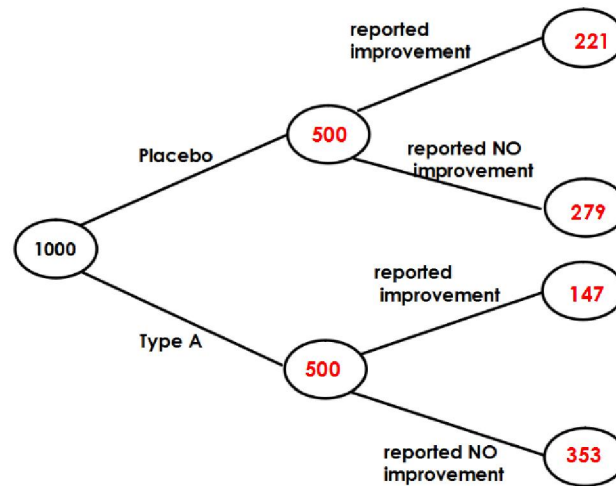
$$64+66=130$$

$$\frac{130}{200}$$

(1 Mark)

5) Frequency trees: Harder

- 3) 1000 people take part in a clinical trial. 500 were given the placebo drug. The rest were given Type A. Of the patients given Type A, 221 patients reported improvement. Overall, 368 patients reported an improvement. Complete the frequency tree.



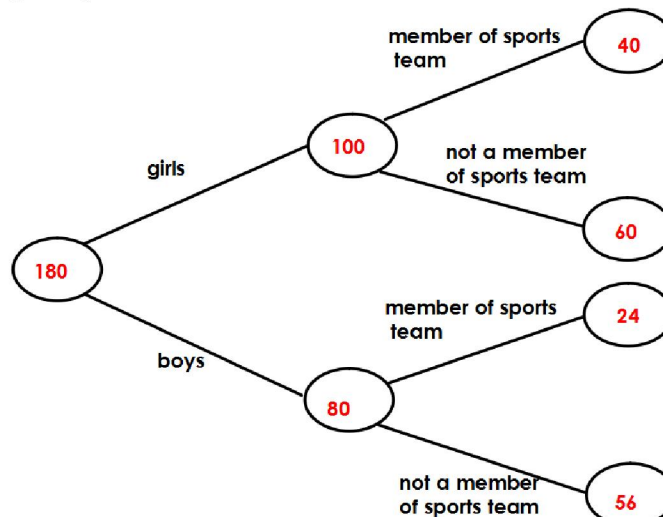
- b) What is the ratio of patients that reported improvement to those who reported no improvement.

368:632

46:79

(1 Mark)

- 4) In a year group in a school there are 180 pupils. The ratio of boys to girls is 4:5. 30% of the boys are part of a sports team. 40% of the girls are part of a sports team. Complete the frequency tree.



WARREN Jack

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Your Exam Statistics

Strand	Overall	Number	Algebra	Data	Shape	Ratio
AO1	11 from 30	3 from 5	0 from 4	5 from 8	3 from 10	0 from 3
A02 and 3	32 from 50	10 from 12	14 from 17	4 from 10	4 from 11	0 from 0
Total	43 from 80	13 from 17	14 from 21	9 from 18	7 from 21	0 from 3

Your Pinpoint Topics

- (1) Simple Proportion. MWatch: , Hegarty:
- (2) Simple Sytematic Listing. MWatch: 69, Hegarty:
- (3) Surface Area. MWatch: 114, Hegarty:
- (4) Scales Diagrams. MWatch: NA, Hegarty:
- (5) Venn diagrams. MWatch: 127, Hegarty:

1) Simple Proportion: Easier

- 1) CDs cost £6 each
How much will 2 of these CDs cost?

$$£6 \times 2 = £12$$

£ 12 _____

(1 Mark)

- 2) Jon buys 9 packets of sweets.
Each packet costs £3.
How much does Jon pay for all 9 packets of sweets?

$$9 \times £3 = £27$$

£ 27 _____

(1 Mark)

- 3) 2 t-shirts cost £10.
How much will 1 t-shirt cost?

$$£10 \div 2 = £5$$

£ 5 _____

(1 Mark)

- 4) 4 pens weigh 80g.
What is the weight of one pen?

$$80g \div 4 = 20g$$

20 _____ g

(1 Marks)

1) Simple Proportion: Medium

5) 2 DVDs cost £14

a) Work out the cost of one of these DVDs

$$£14 \div 2 = £7$$

£ 7 _____

(1 Marks)

b) Work out the cost of 3 of these DVDs

$$£7 \times 3$$

£ 21 _____

(1 Mark)

6) The cost of three books is £24.

a) How much would a customer pay for two of these books?

$$24 \div 3 = £8$$

$$£8 \times 2 = £16$$

£ 16 _____

(1 Marks)

b) How much would a customer pay for five of these books?

$$£8 \times 5 = £40$$

£ 40 _____

(1 Mark)

7) The cost of 5 pencils is 55p

How much will 3 of these pencils cost?

$$55p \div 5 = 11p$$

$$11 \times 3 = 33p$$

_____ 33 _____ p

(2 Marks)

1) Simple Proportion: Harder

- 8) The weight of 4 cakes is 200g
How much will 10 cakes weight?

$$200\text{g} \div 4 = 50\text{g}$$

$$50\text{g} \times 10 = 500\text{g}$$

_____ **500** _____ g

(2 Marks)

- 9) 5 cups of coffee cost £2.50
How much will 1 cup of coffee cost?

$$£2.50 \div 5 = £0.50 \text{ (50p)}$$

£ **0.50** _____

(2 Marks)

- 10) 4 sandwiches cost £5.60
How much will 3 of these sandwiches cost?

$$£5.60 \div 4 = £1.40$$

$$£1.40 \times 3 = £4.20$$

£ **4.20** _____

(3 Marks)

2) Simple Sytematic Listing: Easier

1) Claudia has 3 cards; she lists all the 3 digit numbers she can make.

1 2 3

She lists:

1 2 3

1 3 2

2 1 3

2 3 1

3 2 1

3 1 2

Fill in the missing two combinations

(1 Mark)

2) List all the 2 digit numbers that can be made from these cards

2 1 5

21

25

12

15

52

51

2) Simple Systematic Listing: Medium

- 3) In a football tournament, teams are put into groups. In one group, there is England, Russia, Slovakia and Wales. In the first stage, each team must play every team once.

List all the matches in the first stage.

England v Russia
Wales v Slovakia

England v Wales
Russia v Slovakia

England v Slovakia
Wales v Russia

(2 Marks)

- 4) Meera is choosing 2 books from the library. She is choosing from a selection of Science fiction, Biography and Thriller. She can choose more than one of the same type.

Write down all the combinations of two books that she could take

Science Fiction, Science Fiction

Science Fiction, Biography

Science Fiction, Thriller

Biography, Biography

Biography, Thriller

Thriller, Thriller

2) Simple Sytematic Listing: Harder

- 5) Andrea arranges these four cards to make a 4 digit number. She uses all the cards each time.



How many different 4 digit numbers can she make that are over 5000?

6135 6513 5316

6153 6531 5361

6351 5136 5613

6315 5163 5631

3) Surface Area: Easier

1. The diagram shows a cuboid of dimensions 10cm × 8cm × 5cm.

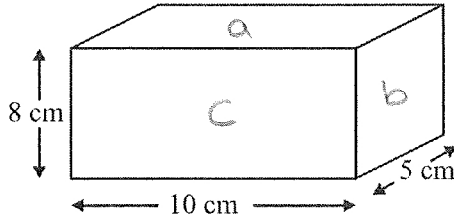


Diagram **NOT** accurately drawn

Work out the total surface area of the cuboid.

State the units with your answer.

3 pairs of sides

(a) Top and Bottom $\rightarrow 10 \times 5 = 50 \text{ cm}^2$ $\xrightarrow{2 \text{ of them}}$ 100 cm^2
 (b) Left and Right $\rightarrow 8 \times 5 = 40 \text{ cm}^2$ $\rightarrow 80 \text{ cm}^2$
 (c) Front and Back $\rightarrow 10 \times 8 = 80 \text{ cm}^2$ $\rightarrow 160 \text{ cm}^2$

TOTAL	340 cm ²	
	340 cm ²	mark for the units

(Total 4 marks)

2. The diagram shows a solid cuboid which is 5 cm by 4 cm by 3 cm.

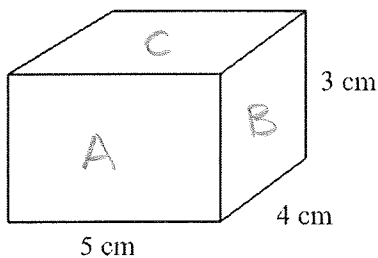


Diagram **NOT** accurately drawn

What is the total surface area of this cuboid?

State the units with your answer.

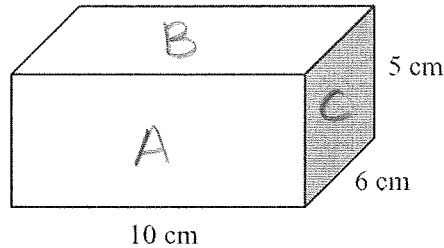
$A = 5 \times 3 = 15$ $\xrightarrow{2 \text{ of those}}$ 30
 $B = 3 \times 4 = 12$ $\rightarrow 24$
 $C = 4 \times 5 = 20$ $\rightarrow 40$

TOTAL	94	mark for units if not given.
-------	----	------------------------------

(Total 4 marks)

3) Surface Area: Medium

3. Here is a cuboid.



$$\begin{array}{r}
 A = 10 \times 5 = 50 \rightarrow 100 \\
 B = 10 \times 6 = 60 \rightarrow 120 \\
 C = 5 \times 6 = 30 \rightarrow 60 \\
 \hline
 280
 \end{array}$$

2 of each

Diagram **NOT** accurately drawn

What is the total surface area of the cuboid?

State the units with your answer.

$$280 \text{ cm}^2$$

(Total 4 marks)

4.

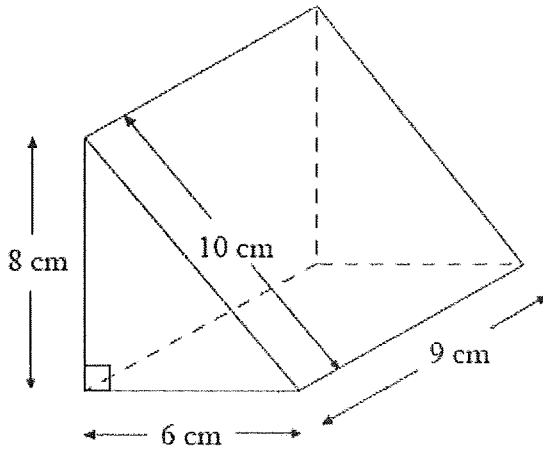


Diagram **NOT** accurately drawn

$$\begin{array}{l}
 2 \times \text{triangle} = \frac{1}{2} \times 8 \times 6 = 24 \rightarrow 48 \\
 \text{slope side} = 10 \times 9 = 90 \\
 \text{base} = 6 \times 9 = 54 \\
 \text{side} = 8 \times 9 = 72
 \end{array}$$

Work out the surface area of the triangular prism.
State the units with your answer.

$$\begin{array}{l}
 \text{TOTAL} = 48 + 90 + 54 + 72 \\
 = 264
 \end{array}$$

$$264 \text{ cm}^2$$

(Total 4 marks)

3) Surface Area: Harder

9.

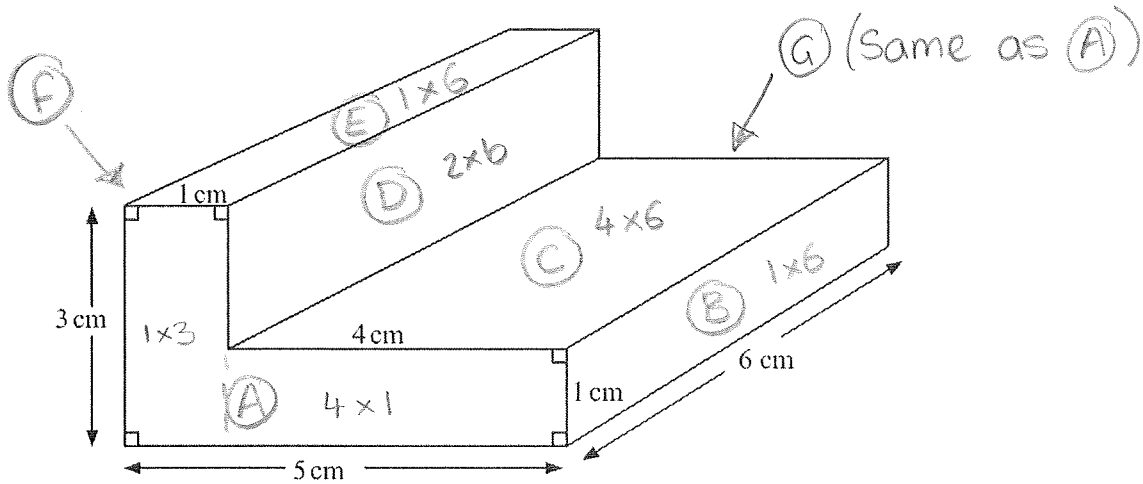


Diagram NOT accurately drawn

Work out the total surface area of the L-shaped prism.
State the units with your answer.

① Label the sides

(A) → Compound shape so split into 2 and work out areas. Add together to make total.

(B) → (E) All easy rectangles

(F) → The one you can't see (3x6)

(G) → Same as (A)

..... 80 cm²

(Total 4 marks)

(A) = 7

(B) = 6

(C) = 24

(D) = 12

TOTAL = 7 + 6 + 24 + 12 + 6 + 18 + 7

= 80 cm²

4) Scales Diagrams: Easier

- 1) A road map has a scale of 1:20000
On the map a road has a length of 4cm. Work out the actual distance. Give your answer in metres.

$$\begin{aligned}
 &1:20000 \\
 &4:80000 \\
 &1m = 100cm \\
 &80000 \div 100 = 800m
 \end{aligned}$$

800m

(2 Marks)

-
- 2) On a map two points are 7cm apart. The map has a scale of 1:10000. Work out the actual distance. Give your answer in km.

$$\begin{aligned}
 &1:10000 \\
 &7:70000 \\
 &1km = 100000cm \\
 &70000 \div 100000 = 0.7km
 \end{aligned}$$

0.7km

(2 Marks)

-
- 3) A map has a scale of 1cm to 50000cm. Two junctions are 1km apart. Work out how far they are apart on the map. Give your answer in cm.

$$\begin{aligned}
 &1:50000 \\
 &1km = 100000cm \\
 &1:50000 \\
 &2:100000
 \end{aligned}$$

2cm

(2 Marks)

4) Scales Diagrams: Medium

- 4) Kim is making a scale model of a car. The length of the car is 2.4m. She uses a scale of 1cm to 12cm. Work out the length of the scale model of the car. Give your answer in cm.

$$\begin{aligned} 2.4\text{m} &= 240\text{cm} \\ 1 &: 12 \\ 20 &: 240 \end{aligned}$$

20cm

(2 Marks)

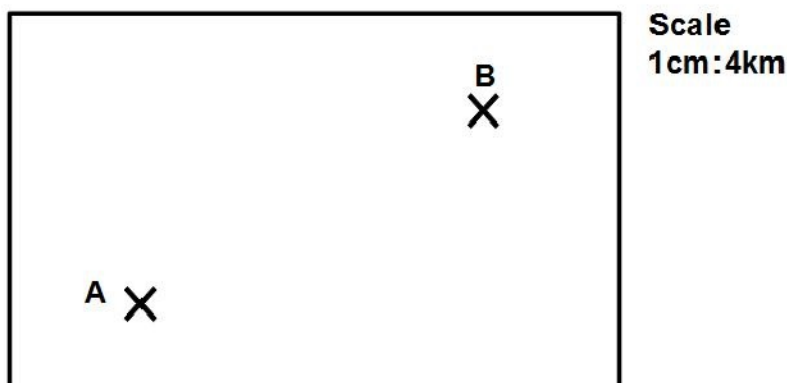
- 5) A model plane has a length of 26cm. The scale of the model is 1:50. Work out the length of the real plane. Give your answer in metres.

$$\begin{aligned} 1 &: 50 \\ 26 &: 1300 \\ 1300 \div 100 &= 13 \end{aligned}$$

13m

(2 Marks)

- 6) The diagram shows the position of two lighthouses.



Work out the actual distance between the lighthouses.

Measures: 3.4 cm (Note: this may be different due to printing)

$$3.4 \times 4 = 13.6 \text{ km}$$

13.6 Km

(2 Marks)

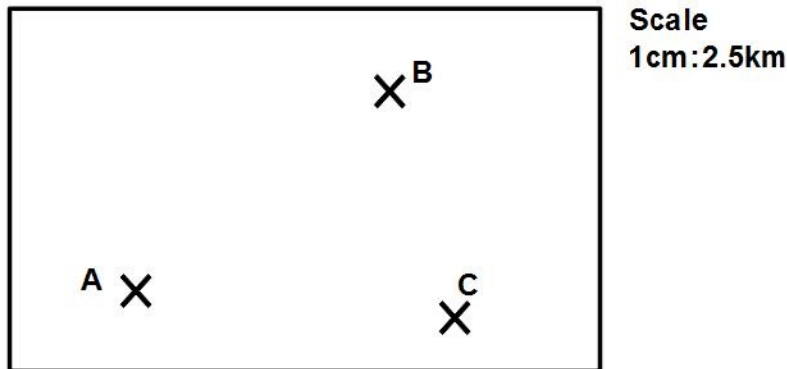
4) Scales Diagrams: Harder

- 7) Ahmed is making a model train. The length of the train is 60m. He uses a scale of 1cm to 30cm. Ahmed says his model should be 2cm. Ahmed is wrong. Give a reason why Ahmed is wrong.

2cm would be 60cm not 60m. 60metres would be 200cm

(1 Mark)

- 8) The diagram below shows three towns, at A, B and C. Sarah drives from town A to town B. Owen drives from town B to town C and then returns to B again. How much further does Owen drive than Sarah?



A to B Measures: 2.3cm (Note: this may be different due to printing)

$$2.3 \times 2.5 = 5.75$$

B to C Measures: 1.9cm (Note: this may be different due to printing)

$$1.9 \times 2.5 =$$

Drives there and back so Owen drives 9.5 km

$$9.5 - 5.75 = 3.75 \text{ km}$$

Owen drives 3.75 km more than Sarah.

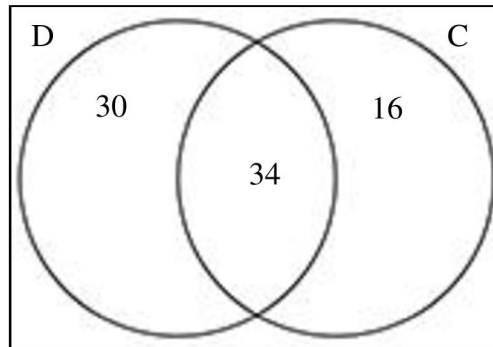
(3 Marks)

5) Venn diagrams: Easier

Solution for Question 1:

Number of people that owned dogs only: $64 - 34 = 30$

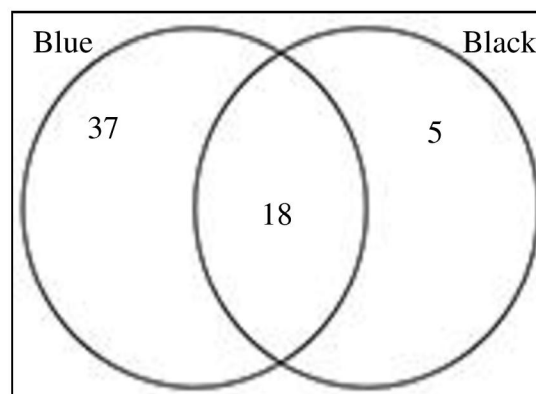
Number of people that owned cats only: $80 - 34 - 30 = 16$



Solution for Question 2:

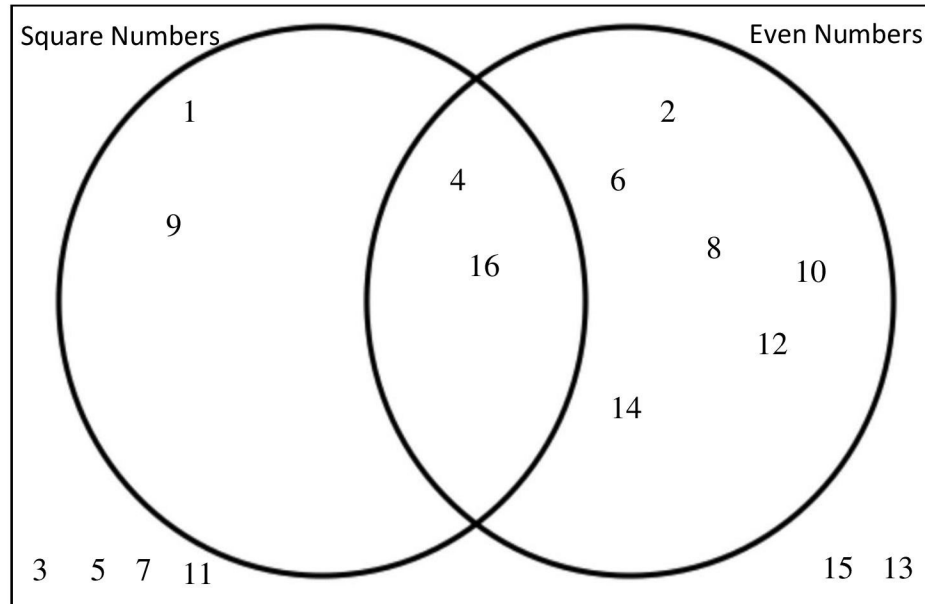
a) Number of people that only had a black pen:
 $60 - 37 - 18 = 5$

b) Probability of a person owning both types of pen:
 $\frac{18}{60} = \frac{3}{10}$



5) Venn diagrams: Medium

Solution for Question 3:



Solution for Question 4:

- a) Tea: $6 + 12 = 18$
 Coffee: $9 + 12 = 21$
 Therefore, False
- b) **no way of knowing**
- c) False

Solution for Question 5:

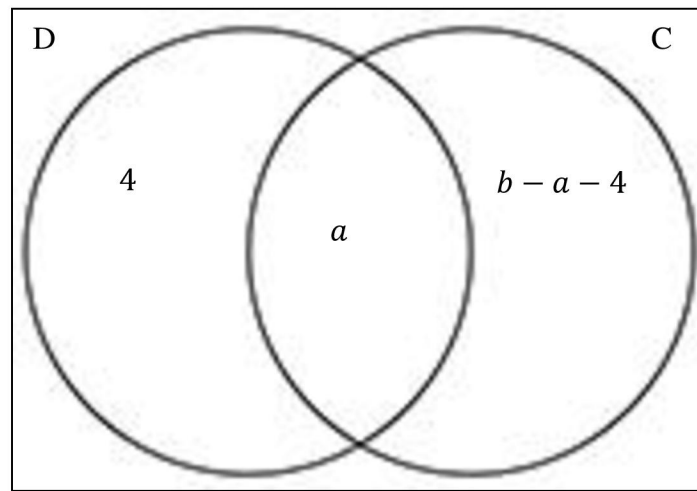
- a)
- i) $A \cap B = A$ and $B = \{9, 15\}$
- ii) $A \cup B = A$ or $B = \{3, 5, 6, 12, 18, 9, 15\}$

5) Venn diagrams: Harder

Solution for Question 6:

Number of people who replied with cats only:

$$b - a - 4$$



BENNETT Isobel

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Your Exam Statistics

Strand	Overall	Number	Algebra	Data	Shape	Ratio
AO1	15 from 30	2 from 5	0 from 4	6 from 8	4 from 10	3 from 3
A02 and 3	31 from 50	8 from 12	11 from 17	6 from 10	6 from 11	0 from 0
Total	46 from 80	10 from 17	11 from 21	12 from 18	10 from 21	3 from 3

Your Pinpoint Topics

- (1) Forming equations from worded questions. MW: 137, Hgrty:
- (2) Surface Area. MWatch: 114, Hegarty:
- (3) Scales Diagrams. MWatch: NA, Hegarty:
- (4) Venn diagrams. MWatch: 127, Hegarty:
- (5) Speed. MWatch: 142, Hegarty:

1) Forming equations from worded questions: Easier

- 1) Tim is 10 years older than Sally. The total of their ages is 100 years. How old is Sally?

$S = \text{Sally's age}$

$$S + (10 + S) = 100$$

$$2S + 10 = 100$$

$$2S = 90$$

$$S = 45$$

45 years old.

(2 Marks)

- 2) Ahmed has twice as much money as Sharif. In total they have £51. How much money does Ahmed have?

$S = \text{Sharif's money}$

$$S + 2S = 51$$

$$3S = 51$$

$$S = \text{£}17$$

$$\text{Ahmed's} = 17 \times 2 = \text{£}34$$

£34

(2 Marks)

- 3) Tony weighs 8kg more than Dave. Jim is twice as heavy as Dave. Their combined weight is 352kg. Calculate Dave's weight as a percentage of Tony's weight to 2 decimal places?

$D = \text{Dave's weight}$

$$D + 8 + D + 2D = 352$$

$$4D + 8 = 352$$

$$4D = 344$$

$$D = 86 \text{ kg}$$

$$T = 94 \text{ kg}$$

$$\therefore 86/94 \times 100 =$$

91.49%

(2 Marks)

1) Forming equations from worded questions: Medium

- 4) The length of a rectangle is double its width. Its perimeter is 33cm. How long is its width?

$$w = \text{width}, \quad 2w = \text{length}$$

$$w + w + 2w + 2w = 33$$

$$6w = 33$$

$$w = \frac{33}{6}$$

$$w = \underline{5.5 \text{ cm}}$$

5.5 cm

(2 Marks)

- 5) A bag contains blue, red and orange balls. There are 3 times as many blue balls as there are red balls. There are 5 times as many orange balls as there are blue balls. Dylan picks a ball at random from the bag. What is the probability it is red?

$$r = \text{red balls}, \quad 3r = \text{blue balls}, \quad 15r = \text{orange balls}$$

$$1 : 3 : 15 = 19$$

$$\therefore p(\text{red}) = \frac{1}{19}$$

1/19

(3 Marks)

- 6) Kim is 9 years younger than James. Mary is three times as old as Kim. The sum of their three ages is 64. Find the ratio of Kim's age to Mary's age to James's age.

$$k = \text{kim}, \quad k + 9 = \text{James}, \quad 3k = \text{Mary}$$

$$k + k + 9 + 2k = 64$$

$$5k + 9 = 64$$

$$\frac{5k}{5} = \frac{55}{5}$$

$$k = 11$$

$$\therefore 11 : 33 : 20$$

$$\text{James} = 20$$

$$\text{Mary} = 33$$

11 : 33 : 20

(3 Marks)

1) Forming equations from worded questions: Harder

- 7) Tormod bought a perfectly square table but found out it won't fit through his study door. To solve the problem, he reduces its width by 9cm but also extends its length by 9cm. Its new area is 309cm^2

What was the area of his original square table?

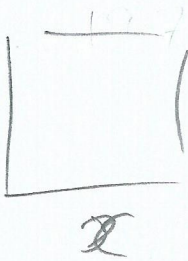
$$x = \text{Side of square.}$$

$$(x-9)(x+9) = 309$$

$$x^2 - 9x + 9x - 81 = 309$$

$$x^2 - 81 = 309$$

$$x^2 = 390$$



$$x \leftarrow x^2 = \text{Area of square table,}$$

$$\underline{\underline{390\text{cm}^2}}$$

$$\underline{390\text{cm}^2}$$

(4 Marks)

2) Surface Area: Easier

1. The diagram shows a cuboid of dimensions $10\text{cm} \times 8\text{cm} \times 5\text{cm}$.

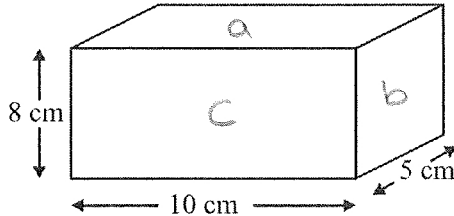


Diagram **NOT** accurately drawn

Work out the total surface area of the cuboid.

State the units with your answer.

3 pairs of sides

(a) Top and Bottom $\rightarrow 10 \times 5 = 50\text{cm}^2$ $\xrightarrow{2 \text{ of them}}$ 100cm^2
 (b) Left and Right $\rightarrow 8 \times 5 = 40\text{cm}^2$ $\rightarrow 80\text{cm}^2$
 (c) Front and Back $\rightarrow 10 \times 8 = 80\text{cm}^2$ $\rightarrow 160\text{cm}^2$

TOTAL	340 cm ²
	340 cm ²

mark for the units

(Total 4 marks)

2. The diagram shows a solid cuboid which is 5 cm by 4 cm by 3 cm.

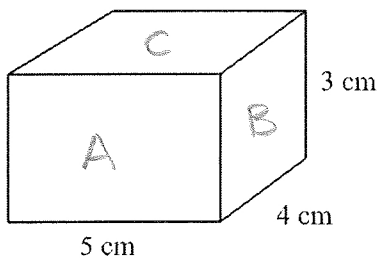


Diagram **NOT** accurately drawn

What is the total surface area of this cuboid?

State the units with your answer.

$A = 5 \times 3 = 15$ $\xrightarrow{2 \text{ of those}}$ 30
 $B = 3 \times 4 = 12$ $\rightarrow 24$
 $C = 4 \times 5 = 20$ $\rightarrow 40$

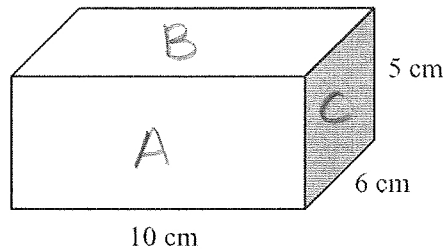
TOTAL	94
-------	----

mark for units if not given.

(Total 4 marks)

2) Surface Area: Medium

3. Here is a cuboid.



$$\begin{array}{r}
 A = 10 \times 5 = 50 \rightarrow 100 \\
 B = 10 \times 6 = 60 \rightarrow 120 \\
 C = 5 \times 6 = 30 \rightarrow 60 \\
 \hline
 280
 \end{array}$$

2 of each

Diagram **NOT** accurately drawn

What is the total surface area of the cuboid?

State the units with your answer.

$$280 \text{ cm}^2$$

(Total 4 marks)

4.

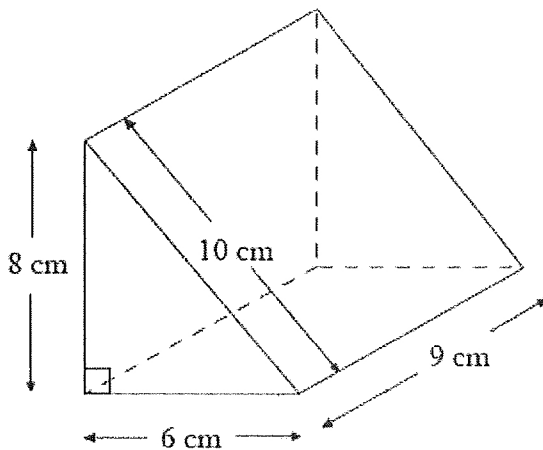


Diagram **NOT** accurately drawn

$$\begin{array}{l}
 2 \times \text{triangle} = \frac{1}{2} \times 8 \times 6 = 24 \rightarrow 48 \\
 \text{slope side} = 10 \times 9 = 90 \\
 \text{base} = 6 \times 9 = 54 \\
 \text{side} = 8 \times 9 = 72
 \end{array}$$

Work out the surface area of the triangular prism.
State the units with your answer.

$$\begin{array}{l}
 \text{TOTAL} = 48 + 90 + 54 + 72 \\
 = 264
 \end{array}$$

$$264 \text{ cm}^2$$

(Total 4 marks)

2) Surface Area: Harder

9.

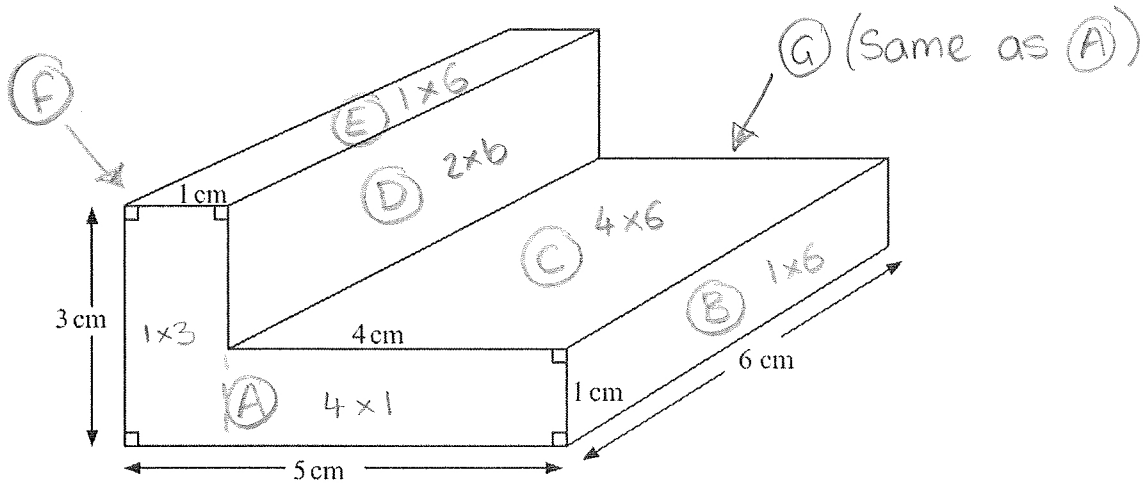


Diagram NOT accurately drawn

Work out the total surface area of the L-shaped prism.
State the units with your answer.

① Label the sides

(A) → Compound shape so split into 2 and work out areas. Add together to make total.

(B) → (E) All easy rectangles

(F) → The one you can't see (3 x 6)

(G) → Same as (A)

..... 80 cm²

(Total 4 marks)

$$(A) = 7$$

$$(B) = 6$$

$$(C) = 24$$

$$(D) = 12$$

$$\text{TOTAL} = 7 + 6 + 24 + 12 + 6 + 18 + 7$$

$$= 80 \text{ cm}^2$$

3) Scales Diagrams: Easier

- 1) A road map has a scale of 1:20000
On the map a road has a length of 4cm. Work out the actual distance. Give your answer in metres.

$$\begin{aligned}
 &1:20000 \\
 &4:80000 \\
 &1m = 100cm \\
 &80000 \div 100 = 800m
 \end{aligned}$$

800m

(2 Marks)

-
- 2) On a map two points are 7cm apart. The map has a scale of 1:10000. Work out the actual distance. Give your answer in km.

$$\begin{aligned}
 &1:10000 \\
 &7:70000 \\
 &1km = 100000cm \\
 &70000 \div 100000 = 0.7km
 \end{aligned}$$

0.7km

(2 Marks)

-
- 3) A map has a scale of 1cm to 50000cm. Two junctions are 1km apart. Work out how far they are apart on the map. Give your answer in cm.

$$\begin{aligned}
 &1:50000 \\
 &1km = 100000cm \\
 &1:50000 \\
 &2:100000
 \end{aligned}$$

2cm

(2 Marks)

3) Scales Diagrams: Medium

- 4) Kim is making a scale model of a car. The length of the car is 2.4m. She uses a scale of 1cm to 12cm. Work out the length of the scale model of the car. Give your answer in cm.

$$\begin{aligned} 2.4\text{m} &= 240\text{cm} \\ 1 &: 12 \\ 20 &: 240 \end{aligned}$$

20cm

(2 Marks)

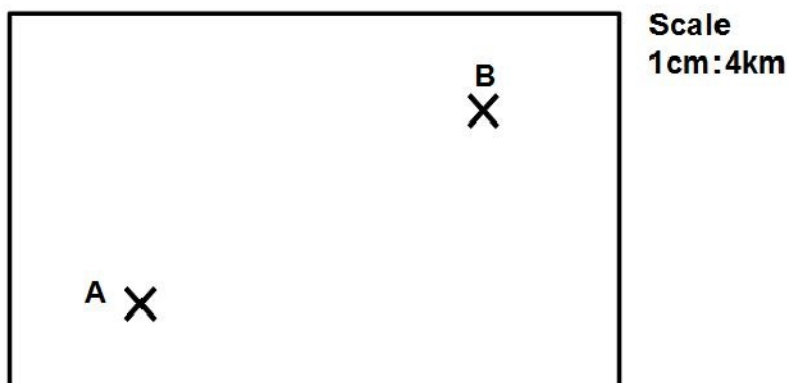
- 5) A model plane has a length of 26cm. The scale of the model is 1:50. Work out the length of the real plane. Give your answer in metres.

$$\begin{aligned} 1 &: 50 \\ 26 &: 1300 \\ 1300 \div 100 &= 13 \end{aligned}$$

13m

(2 Marks)

- 6) The diagram shows the position of two lighthouses.



Work out the actual distance between the lighthouses.

Measures: 3.4 cm (Note: this may be different due to printing)

$$3.4 \times 4 = 13.6 \text{ km}$$

13.6 Km

(2 Marks)

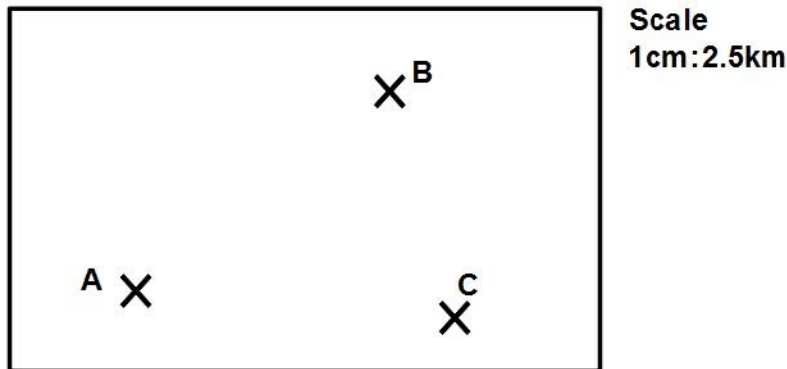
3) Scales Diagrams: Harder

- 7) Ahmed is making a model train. The length of the train is 60m. He uses a scale of 1cm to 30cm. Ahmed says his model should be 2cm. Ahmed is wrong. Give a reason why Ahmed is wrong.

2cm would be 60cm not 60m. 60metres would be 200cm

(1 Mark)

- 8) The diagram below shows three towns, at A, B and C. Sarah drives from town A to town B. Owen drives from town B to town C and then returns to B again. How much further does Owen drive than Sarah?



A to B Measures: 2.3cm (Note: this may be different due to printing)

$$2.3 \times 2.5 = 5.75$$

B to C Measures: 1.9cm (Note: this may be different due to printing)

$$1.9 \times 2.5 =$$

Drives there and back so Owen drives 9.5 km

$$9.5 - 5.75 = 3.75 \text{ km}$$

Owen drives 3.75 km more than Sarah.

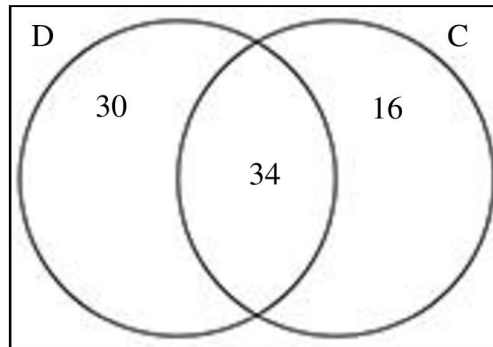
(3 Marks)

4) Venn diagrams: Easier

Solution for Question 1:

Number of people that owned dogs only: $64 - 34 = 30$

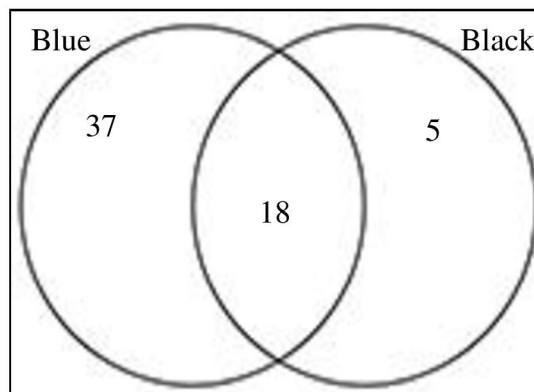
Number of people that owned cats only: $80 - 34 - 30 = 16$



Solution for Question 2:

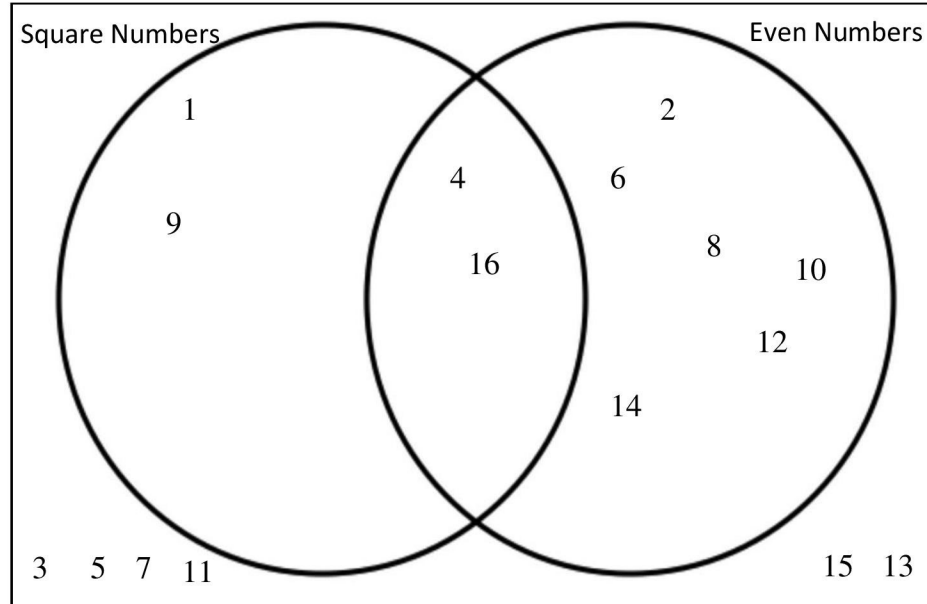
a) Number of people that only had a black pen:
 $60 - 37 - 18 = 5$

b) Probability of a person owning both types of pen:
 $\frac{18}{60} = \frac{3}{10}$



4) Venn diagrams: Medium

Solution for Question 3:



Solution for Question 4:

- a) Tea: $6 + 12 = 18$
 Coffee: $9 + 12 = 21$
 Therefore, False
- b) **no way of knowing**
- c) False

Solution for Question 5:

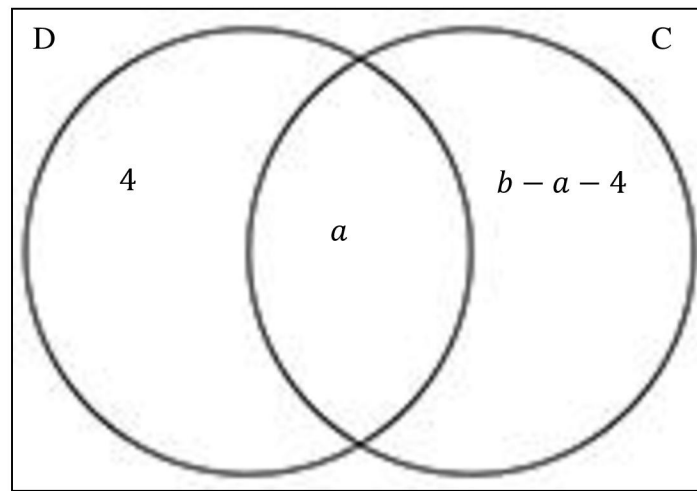
- a)
- i) $A \cap B = A$ and $B = \{9, 15\}$
- ii) $A \cup B = A$ or $B = \{3, 5, 6, 12, 18, 9, 15\}$

4) Venn diagrams: Harder

Solution for Question 6:

Number of people who replied with cats only:

$$b - a - 4$$



5) Speed: Easier

- 1) Pete drove 50 miles in 4 hours
Work out his average speed in miles per hour.

$$\text{speed} = \frac{\text{distance}}{\text{time}} = \frac{50}{4} = \frac{25}{2} = 12.5 \text{ mph}$$

_____ **12.5** _____ miles/hour

(2 Marks)

- 2) Dave cycled 8km in 30 minutes.
Work out Dave's average speed in km/h.

$$30 \text{ mins} = 0.5 \text{ hours}$$

$$\text{speed} = \frac{8}{0.5} = 16 \text{ km/h}$$

_____ **16** _____ Km/h

(3 Marks)

- 3) Jess travels 400km at an average speed of 300 km/h.
How long was she travelling for? Give your answer in minutes.

$$s = \frac{d}{t} \quad \text{so} \quad t = \frac{d}{s} = \frac{400}{300} = \frac{4}{3} = 1\frac{1}{3} \text{ h}$$

$$1 \text{ h} = 60 \text{ mins} \quad \text{so} \quad \frac{1}{3} \text{ h} = 20 \text{ mins}$$

$$\text{so total time} = 60 + 20 = 80 \text{ mins}$$

_____ **80** _____ minutes

(3 Marks)

- 4) Jeff set off for work at 3pm. He arrived at his destination at 5pm.
If Jeff travelled at a constant speed of 24 Km/h, how far did he travel?

$$t = 2 \text{ hours}$$

$$s = \frac{d}{t} \quad \text{so} \quad d = s \times t = 24 \times 2 = 48 \text{ km}$$

_____ **48** _____ Km

(2 Marks)

5) Speed: Medium

Pete needs to catch a ferry.

Pete leaves his home and drives

10 miles towards the motorway

180 miles on the motorway

15 miles from the motorway to the ferry port

Pete

Takes 20 minutes to get to the motorway

Drives at an average speed of 60mph whilst on the motorway

Takes 25 minutes to get from the motorway to the ferry port.

Pete has to arrive at the ferry port no later than midday.

What is the latest time Pete can leave his house?

You must show all your working.



$$T = D/S$$

$$T = 180/60 = 3 \text{ hours}$$

Total time

3 hours

25 minutes

20 minutes +

3hrs 45 mins

Midday = 12:00pm

3hrs 45 mins

Answer
= 8:15am

5) Speed: Harder

Abigail is on a bus going into the city.

The bus picks her up and drives

4 miles towards a motorway

45 miles on the motorway

6 miles from the motorway to the city bus depot

The bus

Takes 10 minutes to get to the main road

Drives at an average speed of 60mph whilst on the motorway

Takes 15 minutes to get from the motorway to the bus depot

Abigail gets on the bus at 10:19am. What time will she get off the bus?

You must show all your working.

4 miles 10 mins	45 miles 60 mph	6 miles 15 mins
Start	↑	End

$T = D/S$
 $T = 45/60 = \frac{3}{4}$
 $= 45 \text{ mins}$

<u>Total time</u> <u>taken</u>
45
15
10
70 mins
or 1 hr 10 mins

10:19 + 1 hr 10 mins

11:29 am