Edu-F | Summer '25 | 1

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Answer **all** questions.

1. (a) Work out $6 + 3 \times 4$. [1]

$6 + 12 = 18$ ✓

(b) Write down the value of the 5 in the number 23542. [1]

500 or 5 hundreds ✓

(c) Write down all the factors of 20. [2]

1, 20 2, 10 4, 5 ✓✓ -1ee

(d) **Estimate** the value of $6{\cdot}8 \times 103{\cdot}12$. [1]

$7 \times 100 = 700$ ✓
(or 680 or 721)

(e) David is rounding **whole numbers** correct to the **nearest 10**.
He says,

"Apart from 750, there are eight whole numbers that round to 750."

Is David correct?

Yes ☐ No ☑

Explain your reasoning. [1]

eg there are 9 ✓

(1, 2, 3, 4, 5, 6, 7, 8, 9)

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03

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2. Michelle has 195 counters.
Alex has 241 counters.

Alex gives some counters to Michelle so that they both have the same number of counters.

How many counters does Alex give to Michelle? [3]

241
+195
436

218
2)436

3
241
-218
023

Alex gives Michelle 23 counters.

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3. (a) Kali has a bag containing 20 marbles.
She chooses one marble from the bag at random.

(i) It is **impossible** for Kali to choose a blue marble.
How many blue marbles are there in Kali's bag? [1]

0 ✓

(ii) It is **likely** that Kali chooses a red marble.
What is the greatest number of red marbles there could be in Kali's bag? [1]

19 ✓

(b) William has a box containing 40 counters.
20 of the counters are purple, 12 of the counters are black, and the remaining counters are green.

A counter is taken at random from the bag.
William says that there is an even chance of choosing a purple counter.

Kali says that William cannot be correct because there are 3 different colours of counter in the bag.

Who is correct?

William ☑ Kali ☐ Neither ☐

Explain your reasoning. [1]

Purple = $\frac{20}{40} = \frac{1}{2}$ = even chance

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(c) Lauren has some pens in a drawer.

A pen is selected at random from the drawer.
The table shows the probability of choosing a blue pen, a black pen or a red pen.

Colour	Blue	Black	Red
Probability	$\frac{7}{20}$	$\frac{1}{4}$	$\frac{3}{20}$

Explain how you know that the drawer must contain pens that are **not** blue, black or red.
You must show all your working. [2]

$\frac{7}{20} + \frac{5}{20} + \frac{3}{20} = \frac{15}{20}$ ✓

Not $= \frac{20}{20}$ so must be other colours ✓ etc

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4. (a) Write $\frac{7}{10}$ as a percentage. [1]

70% ✓

(b) Write 9% as a decimal. [1]

÷100 0·09 ✓

(c) Which of the following fractions is nearer in value to $\frac{13}{20}$?

$\frac{3}{5}$ $\frac{3}{4}$

You must show all your working. [2]

$\frac{12}{20}$ $\frac{15}{20}$ ✓

(AND)

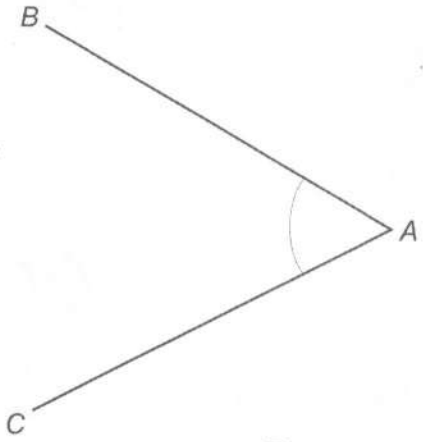
✓

3/5 is nearer in value to $\frac{13}{20}$

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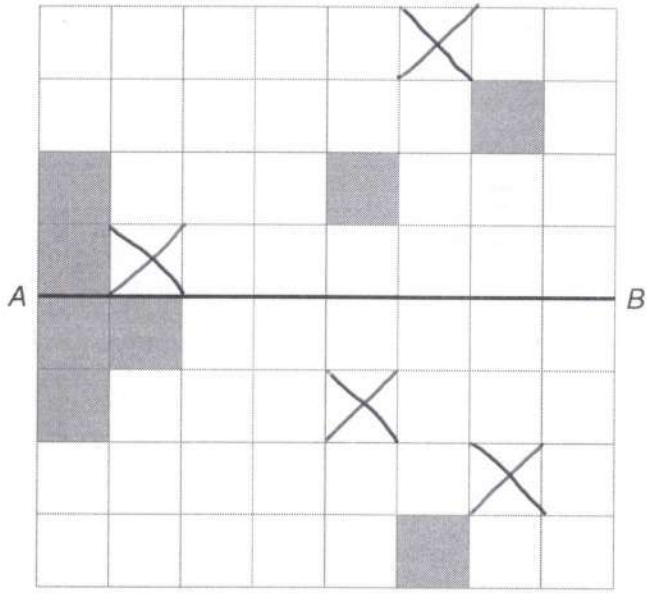
5. (a) Measure and write down the size of angle *BAC*. [1]



Angle *BAC* = 57 °

(±2)

(b) Shade the smallest number of squares to make *AB* a line of symmetry. [2]



✓2
✓All 4
no extra

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09

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6. Annie is buying a laptop.
She pays:

- 30% of the cost as a deposit
- the remaining amount in 20 equal monthly payments.



The laptop costs £800.

How much is each monthly payment? [4]

10% = 80
30% = 240 ✓

Remains = 560 ✓

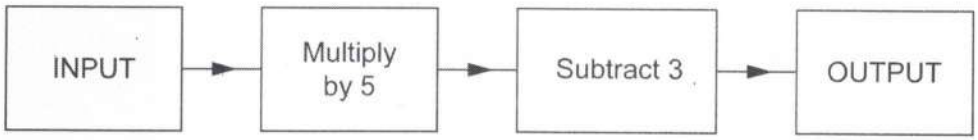
560 ÷ 10 ÷ 2 ✓

Each monthly payment = £ 28 ✓

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7. (a) The diagram below shows a number machine.



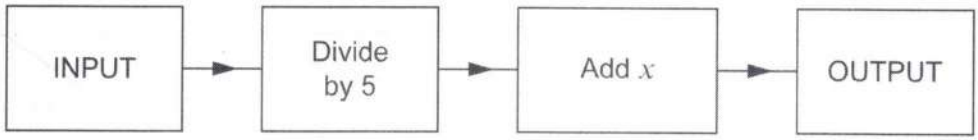
(i) When the INPUT is 70, what is the OUTPUT? [1]

70 x 5 = 350 350 − 3 = 347 ✓

(ii) When the OUTPUT is 42, what is the INPUT? [1]

42 + 3 = 45 45 ÷ 5 = 9 ✓

(b) A different number machine is shown below.



When the INPUT is 60, the OUTPUT is 20.
Find the value of x. [2]

$\frac{60}{5} = 12$ $12 + x = 20$ ✓(OE)

$x = 8$ ✓

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8. (a) Simplify $2a + 6b + a - 2b$. [2]

$3a + 4b$

(b) Solve $9 + w = 25$. [1]

$w = 25 - 9 = 16$

(c) Find the value of $2x + 5y$ when $x = -4$ and $y = 10$. [2]

$-8 + 50 = 42$

(d) Jordan has n strawberries. He eats 3 of them.
Write down, in terms of n, the total number of strawberries Jordan has left. [1]

$n - 3$

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9. (a) On Saturday, Evie plans to spend:

- $\frac{1}{4}$ of the day watching television,
- $\frac{5}{12}$ of the day sleeping,
- 3 hours in the gym.

Evie has homework which will take four hours to complete.
Show that Evie will have enough time to complete her homework. [4]

$24 \div 4 = 6$ (TV) ✓

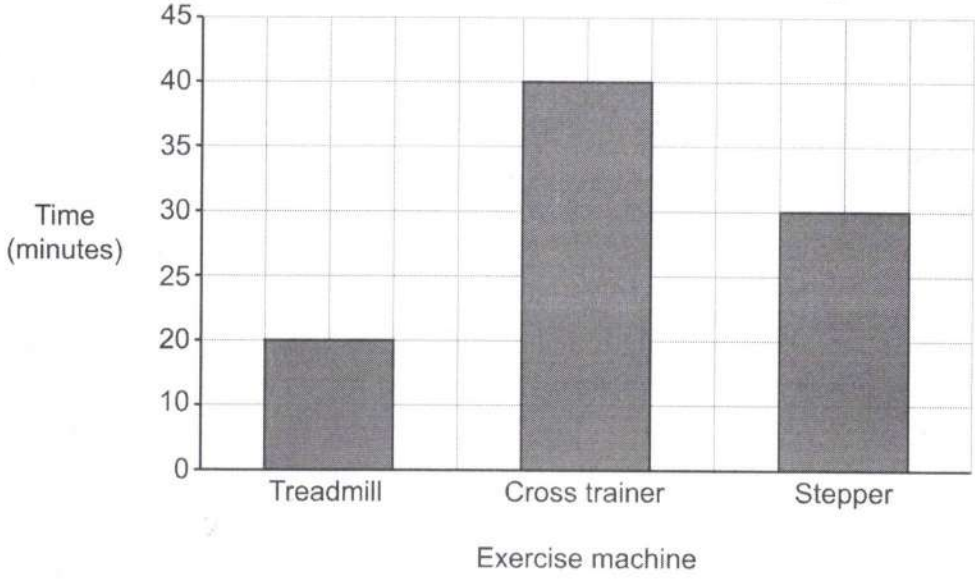
$24 \div 12 \times 5 = 10$ (Sleeping) ✓

$10 + 6 + 3 = 19$ so 5 hrs left (>4)

✓ ✓

(b) Evie goes to the gym again on Sunday.
She draws a bar chart to show the amount of time she spent on each of three of the exercise machines in the gym.

Time spent on exercise machines at the gym



Write one criticism of her bar chart. [1]

Unequal y-axis ✓ etc

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10. Nasir writes down four whole numbers.

The mode of the four numbers is 8.
The median of the four numbers is 7.
The range of the four numbers is 5.

Write Nasir's four numbers in the boxes below. [3]

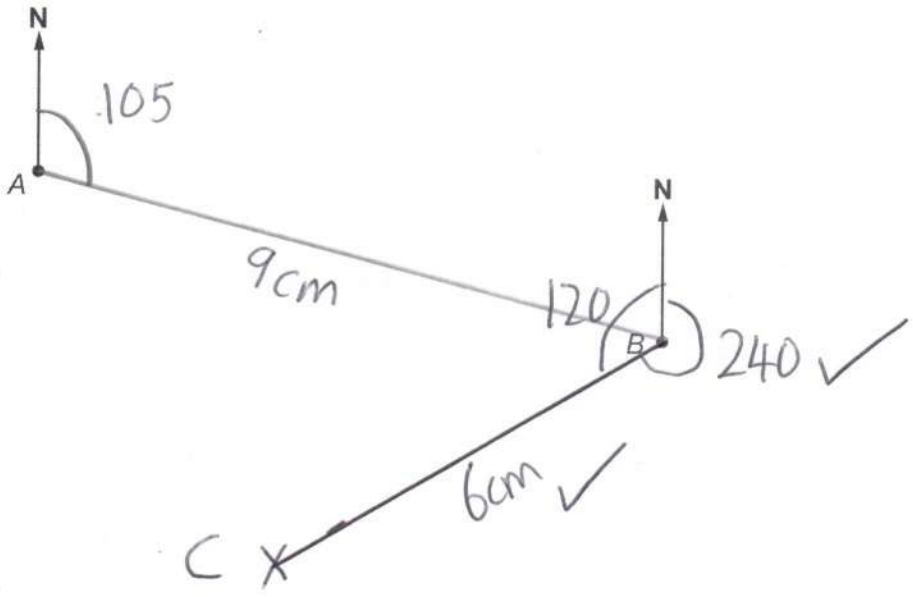
3	6	8	8

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11. Point *A* and point *B* are shown in the scale drawing below.

Scale: 1 cm represents 8 km



(a) Use your scale drawing to find:
- the actual length of *AB*, in kilometres
- the bearing of point *B* from point *A*. [2]

Actual length of *AB* = 72 km (±1·6)

Bearing of point *B* from point *A* = 105 ° (±2)

(b) Point *C* is 48 km from point *B* on a bearing of 240°.
Complete the scale drawing to show the position of point *C*. [2]

6cm 120° clockwise

(c) Point *D* is **due east** of point *B*.
What is the three-figure bearing of point *D* from point *B*? [1]

090 ✓

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12.

Trams from Village Green to Windy Alley

Journey time: 45 minutes

Trams leave Village Green every 12 minutes.
The first tram leaves at 12:00.
The last tram leaves at 22:00.



Liya is catching a tram from Village Green to Windy Alley.
She wants to be at Windy Alley by 13:40.
Liya decides to catch the latest possible tram.

At what time should Liya's tram arrive at Windy Alley?
You must show all your working. [3]

13:40 − 45m = 12:55 ✓

Trams at 12:00, 12:12, 12:24, 12:36, 12:48 ✓

12:48 + 45 = 13:33

✓

Liya's tram should arrive at Windy Alley at or 1:33pm

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13. (a) Express 27 as a **fraction** of 12.
Write your answer in its simplest form. [2]

$\frac{27}{12} = \frac{9}{4}$ or $2\frac{1}{4}$

(b) Using only the numbers in the list below,

1 2 3 5 8 10 16 20 24 100 200

write down

(i) the smallest prime number 2 [1]

(ii) a cube number 1 or 8 [1]

(iii) the square root of 400. 20 [1]

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14. Sam is organising a game.
He has a bag containing 20 balls that are numbered from 1 to 20.

A player selects one ball at random from the bag.
Sam records the number on the ball and puts it back into the bag.

Sam charges players £1.50 to play the game once.
Each player who chooses a ball with the number 14 or higher wins £3.
80 people play the game once.

How much profit does Sam expect to make?
You must show all your working. [6]

$\geq 14 = \frac{7}{20}$ ✓

✓ $80 \div 20 \times 7 = 28$ winners ✓

$80 \times £1.50 = 80 + 40 = £120$ takings ✓

$28 \times 3 = £84$ in prizes

$120 - 84$ ✓

Expected profit = £ 36 ✓

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15. Sarah drove from her home to her friend's house.
Here is a travel graph for her journey.



(a) Sarah stopped at a cafe on her way to her friend's house.
How many minutes did it take Sarah to drive to the cafe? [1]

30

(b) Sarah stayed at her friend's house for 90 minutes.
She then drove home at a steady speed without stopping.
She arrived home at 13:15.

(i) Complete the travel graph. [2]

(ii) Calculate the average speed for the journey home from her friend's house. [2]

25 ÷ 0.5

50

Average speed = ... miles per hour

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16. (a) Share £480 in the ratio 7 : 5. [2]

480 ÷ 12 = 40 m✓

7 × 40 = 280
5 × 40 = 200 280 : 200 ✓

(b) Express 42 as a percentage of 300. [2]

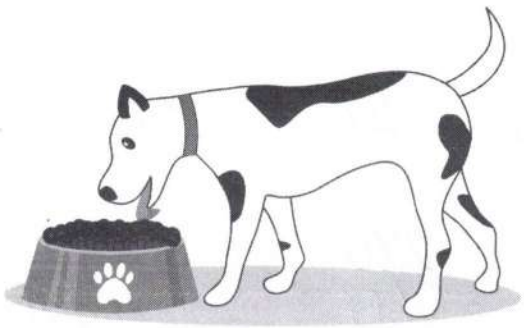
$\frac{42}{300} \times 100$ ✓

= 14% ✓

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17.



(a) Malakai's dog eats $\frac{2}{3}$ of a tin of food each day.

What is the least number of tins Malakai needs to feed his dog for 7 days?
You must show all your working. [3]

$\frac{2}{3} \times \frac{7}{1} = \frac{14}{3} = 4\frac{2}{3}$

$= 5$ tins

(b) Malakai's dog has 15% black fur.
The rest of its fur is white.

Write the proportion of black fur to the proportion of white fur as a ratio in its simplest form. [2]

B : W
15 : 85
3 : 17

$5\overline{)85}$ = 17

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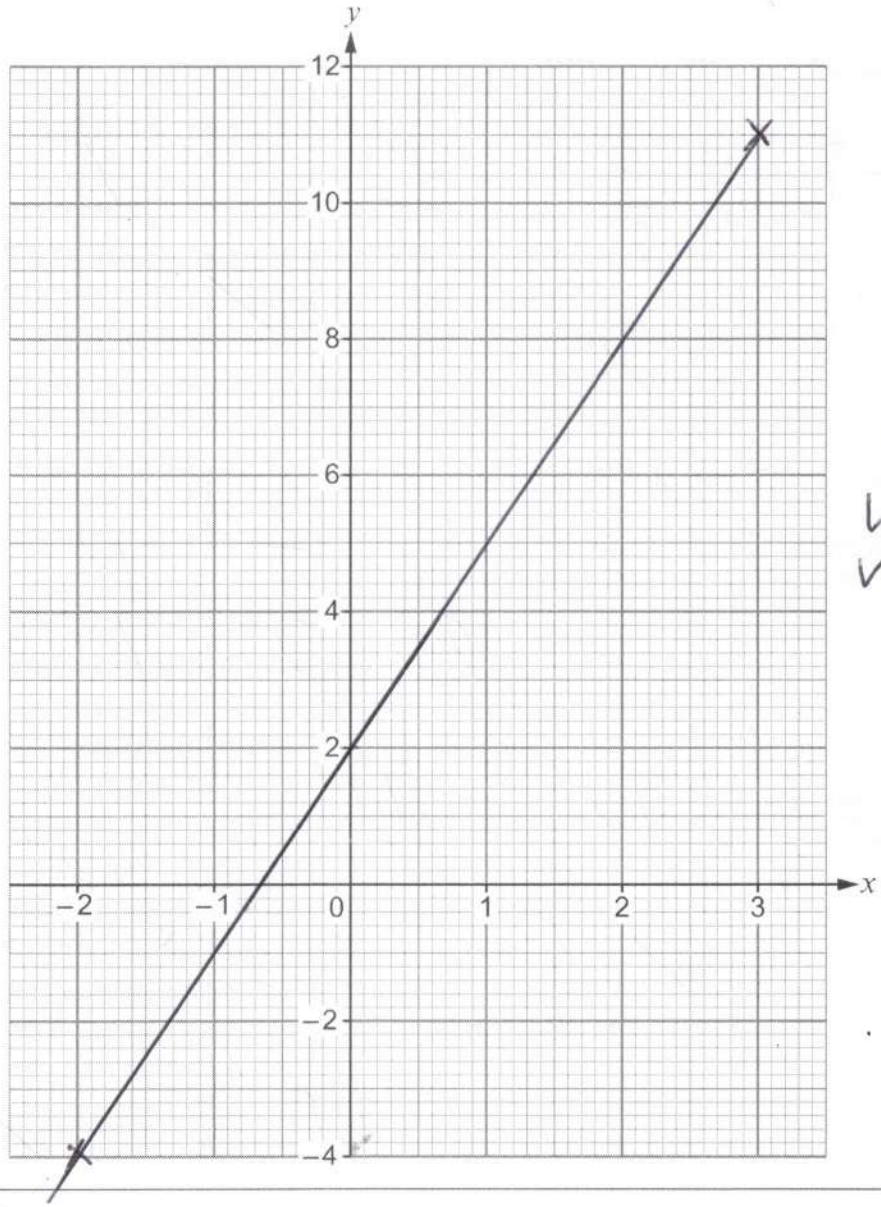
18. The table below shows some of the values of $y = 3x + 2$ for values of x from –2 to 3.

x	–2	–1	0	1	2	3
$y = 3x + 2$	–4	–1	2	5	8	11

(a) Complete the table by finding the values of y for $x = -2$, $x = 1$ and $x = 3$. [2]

✓2
✓✓3

(b) On the graph paper below, draw the graph of $y = 3x + 2$ for values of x from –2 to 3. [2]



✓5
✓complete

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19. Tom, Molly and Peter work in a restaurant.
Customers give them tips if they receive good service.
The tips they are each given are collected in a single jar.



At the end of each week, the tips in the jar are shared in the ratio of hours they worked that week.

(a) One week, they work the following hours:

- Tom works for 7 hours
- Molly works for 8 hours
- Peter works for 10 hours.

} 25

Peter says,

> I should receive 12% more of the tips than Tom.

Show that Peter is correct. [2]

$P-T = \frac{3}{25} = \frac{12}{100} = 12\%$ ✓ ✓

(b) At the end of a **different** week, there is £70 in the jar.

Peter works half as many hours as Tom.
Molly works twice as many hours as Tom.

How much should Molly receive? [3]

	T	M	P
(eg)	2	4	1

✓

$M = \frac{4}{7} \times 70 = \frac{40}{1}$ ✓

Molly should receive £ 40 ✓

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20. A quarter of a circle has been cut from a rectangular card.

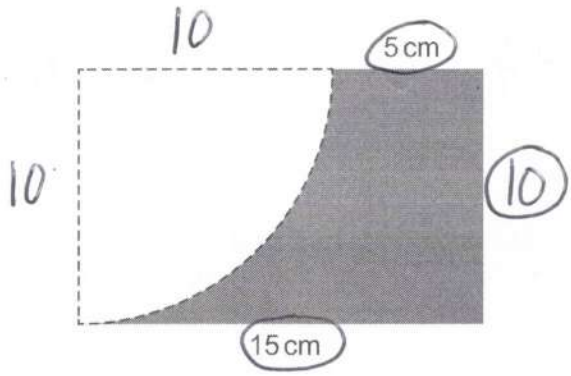


Diagram not drawn to scale

Calculate the perimeter of the remaining piece of card.
Give your answer in the form $a\pi + b$. [4]

$15 + 10 + 5 + \frac{1}{4} \times 2 \times \pi \times 10$

Perimeter of the remaining piece of card is $5\pi + 30$ cm

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21. (a) Given that $3^{m+4} = 1$, find the value of m. [1]

$m + 4 = 0$ $\quad m = -4$ ✓

(b) Betty bought c cakes costing £2 each and d doughnuts costing £1.50 each. She paid with a twenty pound note and was given some change.

Write an inequality to show this information. [2]

$2c + 1.5d < 20$

✓ ✓

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22. The shape below is a triangular prism with $CD = 7$ cm.
The cross-section of the prism is a right-angled triangle where $AB = 6$ cm and $AC = 10$ cm.

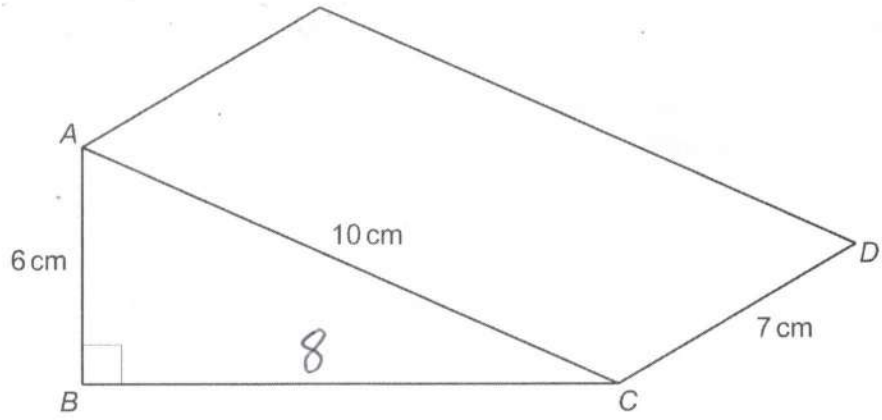


Diagram not drawn to scale

Calculate the total surface area of the triangular prism. [6]

$BC = \sqrt{10^2 - 6^2} = \sqrt{100 - 36} = \sqrt{64}$ ✓✓

$= 8$ ✓

Base Back + Top + 2 sides

$(8 \times 7) + (6 \times 7) + (10 \times 7) + 2(\frac{1}{2} \times 8 \times 6)$ ✓✓

$56 + 42 + 70 + 48$

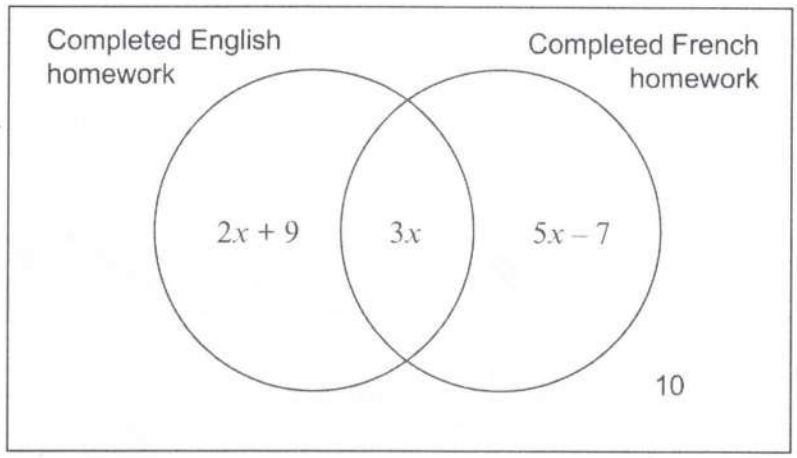
The total surface area of the triangular prism is 216 cm^2 ✓

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23. Last week, 142 pupils in Year 7 were given English homework and French homework.

10 pupils did not complete either homework.
Each expression in the following Venn diagram represents the number of pupils that completed at least one homework.



(a) Calculate the value of x. [3]

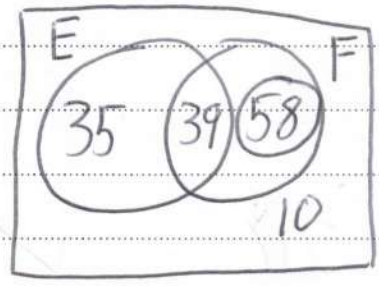
$2x+9+3x+5x-7+10 = 142$ ✓

$10x = 130$ ✓

$x =$ 13 ✓

(b) One pupil is chosen at random from the group.

What is the probability that this pupil completed **only** the French homework? [2]



58 ✓

142 ✓

The probability that a pupil completed **only** the French homework is

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24. (a) Calculate the value of the reciprocal of 0·4. Give your answer as a decimal. [2]

$= \frac{2}{5}$

✓ $\frac{5}{2} = 2.5$ ✓

(b) **Estimate** the value of $\frac{3 \cdot 02^3 + \sqrt{4 \cdot 17 \times 8 \cdot 9}}{0 \cdot 289}$. [3]

$= \frac{3^3 + \sqrt{4 \times 9}}{0.3}$ ✓

$= \frac{27 + 6}{3/10}$

$= 33 \times \frac{10}{3_1}$ ^{11} ^{33} ✓ etc

$= 110$ ✓ CAO

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25.

Use:

$$\text{Pressure} = \frac{\text{Force (N)}}{\text{Area (cm}^2\text{)}}$$

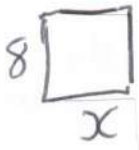
$F = 6{\cdot}2$

$P = \frac{1}{20}$

A cuboid rests on a horizontal floor.

The cuboid exerts a force of 6·2 newtons on the floor.
The pressure of this cuboid on the floor is 0·05 N/cm^2.

The base of the cuboid in contact with the floor has a **width** of 8 cm.



Calculate the **length** of the base of the cuboid. [5]

$\frac{1}{20} = \frac{6{\cdot}2}{8x}$ ✓ ✓

$8x = 6{\cdot}2 \times 20 = 124$ ✓

$8\overline{)124{\cdot}0}$ ✓ $15{\cdot}5$

Length of the base of the cuboid = 15·5 cm ✓

26. Work out the value of $5^{-32} \div 5^{-35}$. [2]

$5^{-32--35} = 5^{3}$ ✓

$= 125$ ✓

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27. It takes 5 workers a total of 24 hours to build a wall 180 m long.

(a) The workers have enough materials left over to build a further 300 m of the same wall.

How long will it take **8 workers** to build this 300 m of wall? [3]

5w 24h 180m

1w 24h 36m

8w 3h 36m

8w 1h 12m

8w 25h 300m

$$5\overline{)180}^{\,36}$$

$$12\overline{)300}^{\,25}$$

✓ ✓

It will take 8 workers 25 hours to build 300 m of wall. ✓

(b) (i) What assumption have you made in answering part (a)? [1]

All workers work at the same rate ✓ etc

(ii) If your assumption is not correct, what effect would this have on your answer to part (a)? [1]

eg If some are slower the time will increase ✓

END OF PAPER

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