.CG Maths.
Worked Solutions

GCSE

C300U10-1

S25-C300U10-1

eduqas Part of WJEC

THURSDAY, 15 MAY 2025 – MORNING

MATHEMATICS – Component 1
Non-Calculator Mathematics
FOUNDATION TIER

2 hours 15 minutes

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	6	
2.	3	
3.	5	
4.	4	
5.	3	
6.	4	
7.	4	
8.	6	
9.	5	
10.	3	
11.	5	
12.	3	
13.	5	
14.	6	
15.	5	
16.	4	
17.	5	
18.	4	
19.	5	
20.	4	
21.	3	
22.	6	
23.	5	
24.	5	
25.	5	
26.	2	
27.	5	
Total	120	

ADDITIONAL MATERIALS

An additional formulae sheet.

The use of a calculator is not permitted in this examination.

A ruler, protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet. If you run out of space, use the additional page(s) at the back of the booklet, taking care to number the question(s) correctly.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

You are reminded of the need for good English and orderly, clear presentation in your answers.

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Please note that these worked solutions have neither been provided nor approved by Eduqas and may not necessarily constitute the only possible solutions. Please refer to the original mark schemes for full guidance.

Any writing in blue should be written in the exam.

Anything written in green in a rectangle doesn't have to be written in the exam.

If you find any mistakes or have any requests or suggestions, please send an email to curtis@cgmaths.co.uk

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Formula list

Area and volume formulae

Where r is the radius of the sphere or cone, l is the slant height of a cone and h is the perpendicular height of a cone:

Curved surface area of a cone = πrl

Surface area of a sphere = $4\pi r^2$

Volume of a sphere = $\frac{4}{3}\pi r^3$

Volume of a cone = $\frac{1}{3}\pi r^2 h$

Kinematics formulae

Where a is constant acceleration, u is initial velocity, v is final velocity, s is displacement from the position when $t = 0$ and t is time taken:

$$v = u + at$$

$$s = ut + \frac{1}{2}at^2$$

$$v^2 = u^2 + 2as$$

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Answer **all** questions.

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

6 + 12 ← BIDMAS, the order operations, should be followed. So the multiplication is done first. 3 × 4 = 12

18

(b) Write down the value of the 5 in the number 23 542. [1]

500 ← The 5 is in the hundreds place

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

1, 20, 2, 10, 4, 5 ← Writing the factors in pairs starting with the smallest and largest. 1 × 20 = 20, so both 1 and 20 are factors of 20

(d) **Estimate** the value of 6·8 × 103·12. [1]

7 × 100 ← Rounding both numbers to 1 significant figure. 6.8 rounds to 7 and 103.12 rounds to 100

700

(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]

745, 746, 747, 748, 749, 751, 752, 753, 754

Listing all the whole numbers which round to 750 to the nearest 10, apart from 750. There are nine of them so David is not correct

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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]

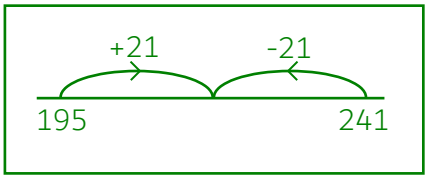
$$\begin{array}{r} {}^{1}\cancel{2}\,{}^{13}\cancel{4}^{1}1 \\ -\,1\,9\,5 \\ \hline 4\,6 \end{array}$$

Subtracting the 195 counters from the 241 counters finds that there is a difference of 46 counters between how many Michelle has and how many Alex has

$$\begin{array}{r} 2\,3 \\ \hline 2\,\big|\,4\,6 \end{array}$$

Halving the difference finds that 23 counters are given

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 ← If there were any blue marbles, there would be some chance of choosing a blue marble

(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 ← Likely means that it is more than half chance but not certain

(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]

$\frac{20}{40} = \frac{1}{2}$ ← 20 out of the 40 counters are purple. This simplifies to 1/2 of the counters, which means that there is an even chance of choosing a purple counter

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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]

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

Multiplying both the numerator and denominator of 1/4 by 5 gives 5/20. Adding all the probabilities gives 15/20, which is not 1, so there must be other colours so that it is certain to pick one of the colours. The probability of something which is certain is 1

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

70% ← Multiplying both the numerator and denominator of 7/10 by 10 gives 70/100. So it must be 70% as percentage is out of 100

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

0.09 ← Dividing a percentage by 100 converts it to a decimal. 9 ÷ 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]

$\frac{3}{5} = \frac{12}{20}$ ← Multiplying both the numerator and denominator of 3/5 by 4 gives 12/20, so that the denominator is the same as 13/20

$\frac{3}{4} = \frac{15}{20}$ ← Multiplying both the numerator and denominator of 3/4 by 5 gives 15/20, so that the denominator is the same as 13/20

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

12/20 is 1/20 away from 13/20. 15/20 is 2/20 away from 13/20. So 12/20 (which was 3/5) is nearer

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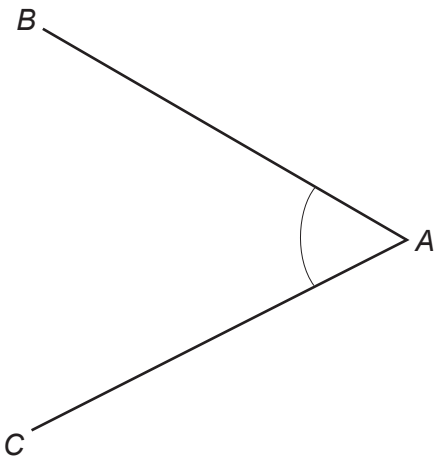
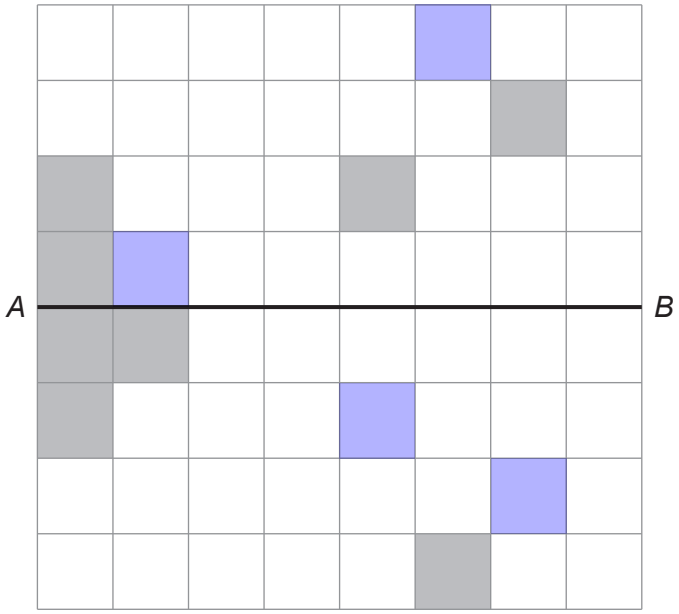
5. (a) Measure and write down the size of angle *BAC*. [1]



Angle *BAC* = 57 °

Measured using a protractor

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



Both halves of the line need to be the same but reflections of each other

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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]

100 - 30 ← Subtracting the 30% from 100% finds that 70% of the cost is for the monthly payments

800 ÷ 10 ← Dividing the £800 by 10 finds that 10% of the cost is £80

80 × 7 ← Multiplying the value of 10% by 7 finds that 70% of the cost is £560. This is the total of the 20 equal monthly payments

$$\begin{array}{r} 0\ 2\ 8 \\ 20\overline{)5\ {}^{5}6^{16}0} \end{array}$$

← Dividing the total of the equal monthly payments by the 20 finds that each monthly payment is £28

Each monthly payment = £ 28

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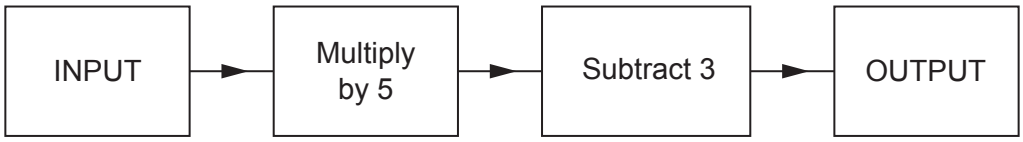
7. (a) The diagram below shows a number machine.



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

70 × 5 ← Multiplying the input by 5 gives 350

350 - 3 ← Subtracting 3 from 350 gives 347 as the output

347

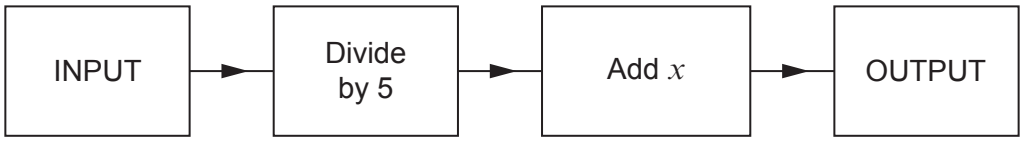
(ii) When the OUTPUT is 42, what is the INPUT? [1]

42 + 3

45 ÷ 5 ← Going backwards from the output to the input by doing the opposite operations in the opposite order

9

(b) A different number machine is shown below.



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

60 ÷ 5 ← Dividing the input by 5 gives 12

x = 8 ← 8 must be added to the 12 to get the output of 20

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

3a + 4b ← Collecting like terms. 2a + a = 3a and 6b - 2b = 4b

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

w = 16 ← Subtracting 9 from both sides gets w on its own

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

-8 + 50 ← Substituting in the values of x and y. 2 × -4 = -8 and 5 × 10 = 50

42 ← -8 + 50 = 50 - 8 = 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 ← Subtracting 3 from the number of strawberries expresses how many are left

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9. (a) On Saturday, Evie plans to spend: ← A day is 24 hours

- $\frac{1}{4}$ 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]

$24 \div 4 = 6$ ← This finds that 1/4 of the day is 6 hours, which is spent watching television

$24 \div 12$ ← This finds that 1/12 of the day is 2 hours

$2 \times 5 = 10$ ← Multiplying the value of 1/12 of the day by 5 finds that 5/12 of the day is 10 hours, which is spent sleeping

$6 + 10 + 3 + 4 = 23$ ← Adding the 6 hours spent watching television, the 10 hours spent sleeping, the 3 hours in the gym and the 4 hours for homework shows that this all takes 23 hours, which is less than 24 hours so Evie will have enough time

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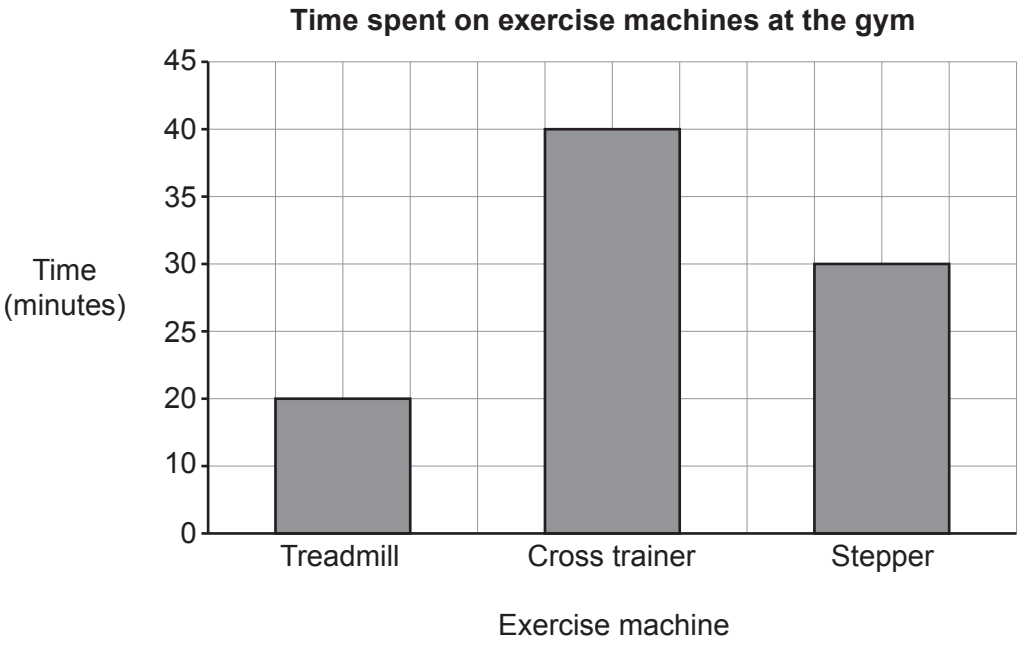
(b) Evie goes to the gym again on Sunday.
She draws a bar chart to show the amount of time she spent on each of three of the exercise machines in the gym.



Write one criticism of her bar chart. [1]

The vertical scale does not continue to go up by the same amount

It goes up in 10s then goes up in 5s

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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

The mode is 8 so there must be more 8s than any other number.

For the median (the middle number when they are put in order) to be 7, there can only be two 8s and these must be the greatest numbers. Both the 2nd and 3rd number are in the middle so the median of 7 must be halfway between these. 7 is halfway between 6 and 8, so the 2nd number must be 6.

The range is 5 so the smallest number must be 3 in order for there to be a difference of 5 between the largest and smallest numbers

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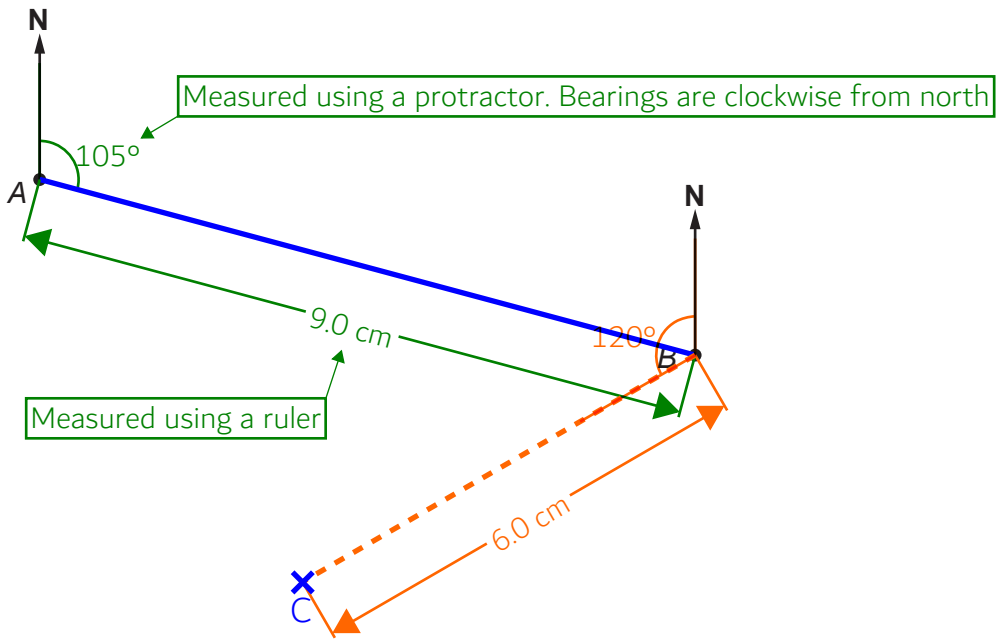
11. Point *A* and point *B* are shown in the scale drawing below.

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]

9 × 8 ← Every 1 cm is 8 km so multiplying the measured 9 cm by 8 finds that it represents 72 km

Actual length of *AB* = ... 72 ..... km

Bearing of point *B* from point *A* = ... 105 ..... °

(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]

48 ÷ 8 = 6 ← Dividing the 48 km by 8 finds that it is represented by 6 cm

360 - 240 = 120 ← There are 360° around a point. Subtracting the 240° clockwise from north finds that it is 120° anticlockwise from north

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

090° ← East is 90° clockwise from north. 0 must be written before to make it three-figure

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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]

12, 24, 36, 48, 60 ← Listing the 12 times table finds that the tram leaves at 12, 24, 36, 48, 60 minutes past the hour. As there are 60 minutes in an hour, the 60 minutes past the hour is actually 1 hour later

$$\begin{array}{r} 48 \\ +45 \\ \hline 93 \\ {\scriptstyle 1} \end{array}$$

← The 13:00 tram is too late as this would arrive at 13:45. So the tram before this should be used. This leaves at 12:48. Adding the 45 minutes to the 48 minutes finds that it would be 12:93... but the 93 is over 60 minutes so subtracting 60 minutes and converting this to an hour gives the arrival time of 13:33

Liya's tram should arrive at Windy Alley at ..... 13:33 .....

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

$\frac{27}{12}$ ← Expressing 27 as a fraction of 12

$\frac{9}{4}$ ← Simplifying the fraction by dividing both the numerator and denominator by 3. It cannot go any simpler as 9 and 4 cannot be divided by the same amount to get smaller whole numbers

(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 [1]

2 ← 2 is prime as it is only divisible by itself and 1. 5 is also prime but 2 is smaller

(ii) a cube number [1]

1 ← $1^3 = 1 \times 1 \times 1 = 1$, so 1 is a cube number

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

20 ← The square root of 400 must end in a zero as only this digit multiplied by itself will end in a zero. $20^2 = 20 \times 20 = 400$, so 20 is the square root of 400

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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]

$80 \times 1.5 = 80 + 40 = 120$ ← Multiplying the 80 players by the £1.50 finds that the income is £120. 1 × 80 = 80 and 0.5 × 80 = 40 so 1.5 × 80 = 120

14, 15, 16, 17, 18, 19, 20 ← Listing the numbers which are 14 or higher. There are 7 possibilities of winning and 20 balls in total so the probability of winning is 7/20

$80 \div 20$
4×7 ← Finding 7/20 of the 80 players by dividing the 80 by the 20 to get 4 then multiplying this by the 7. So 28 players are expected to win

$$\begin{array}{r} 28 \\ \times\ 3 \\ \hline 84 \\ {\scriptstyle 2} \end{array}$$
← Multiplying the 28 expected winners by the £3 each will win finds that the outgoings are expected to be £84

$$\begin{array}{r} {\scriptstyle 0\ 11} \\ 1\ 2^{1}0 \\ -\ 8\ 4 \\ \hline 3\ 6 \end{array}$$
← Subtracting the outgoings from the income finds that the expected profit is £36

Expected profit = £ 36

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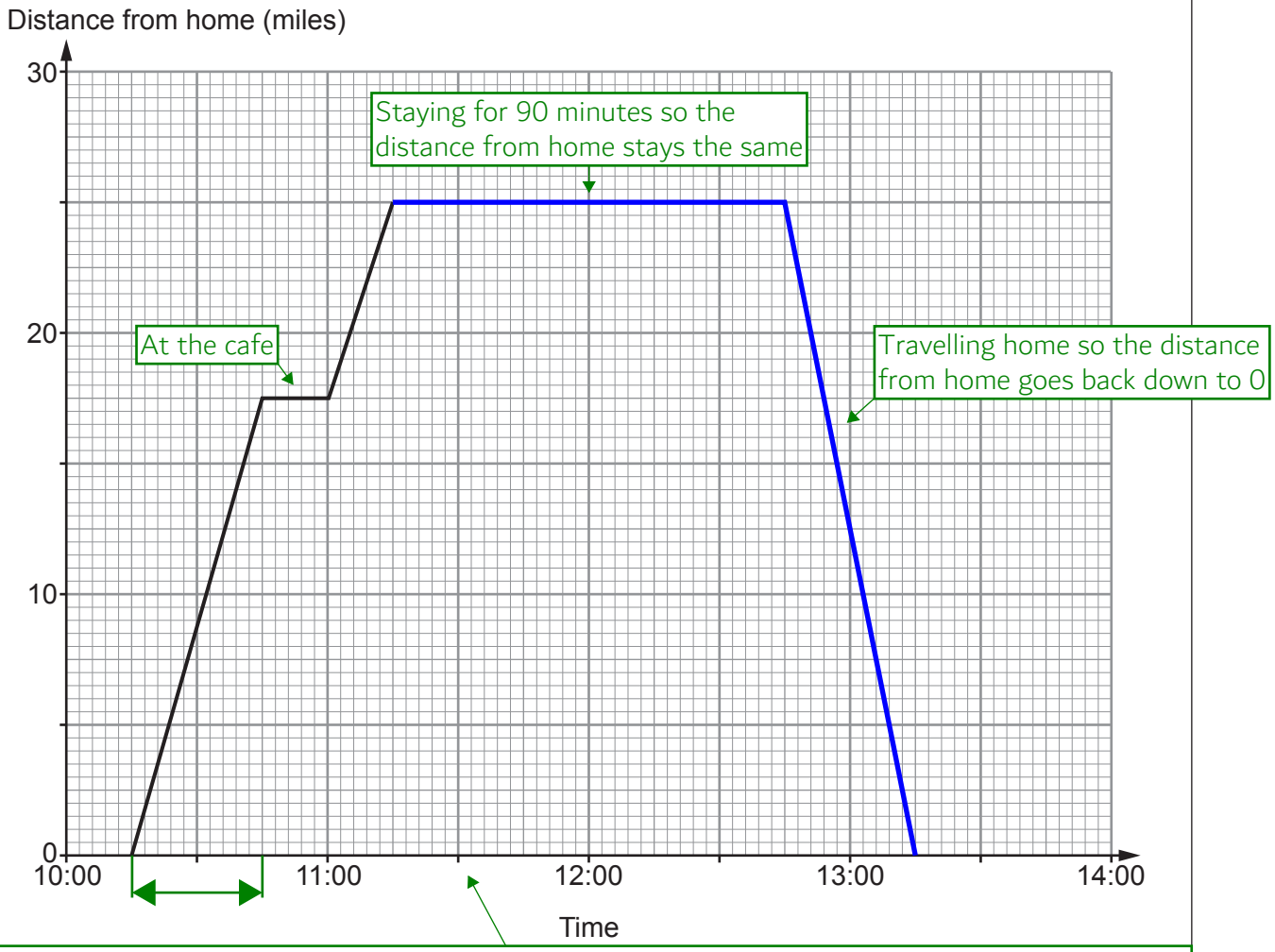
15. Sarah drove from her home to her friend's house.
Here is a travel graph for her journey.



The scale goes up 60 minutes over 20 small boxes. 60 ÷ 20 = 3, so each small box is worth 3 minutes

(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 ← It goes across 10 small boxes for the journey to the cafe. 10 × 3 = 30 minutes

(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]

$25 \div \frac{1}{2}$ ← Miles per hour means to divide the miles travelled by the time taken in hours. 30 minutes is 1/2 an hour

25×2 ← To divide by a fraction: keep the 1st number, change the division to a multiplication, flip the 2nd fraction. 2/1 = 2

Average speed = ... 50 ..... miles per hour

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

$7 + 5$ ← Adding the 7 and 5 finds that there are 12 parts in total in the ratio

$$\begin{array}{r} 0\ 4\ 0 \\ 12\,\overline{)\,4\ {}^{4}8\ 0} \end{array}$$

← Dividing the total of £480 by the 12 parts in total in the ratio finds that 1 part of the ratio is worth £40

40×7 ← Multiplying the value of 1 part of the ratio by 7 finds that the value of 7 parts of the ratio is £280

40×5 ← Multiplying the value of 1 part of the ratio by 5 finds that the value of 5 parts of the ratio is £200

£280 and £200

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

$\frac{42}{300}$ ← Expressing 42 as a fraction of 300

$$\begin{array}{r} 1\ 4 \\ 3\,\overline{)\,4\ {}^{1}2} \end{array}$$

← Dividing both the numerator and denominator by 3 gives 14/100

14% ← Percentage is out of 100 so 14/100 is 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]

$\frac{7}{1} \times \frac{2}{3}$ ← Multiplying the 7 days by the 2/3 of a tin each day finds the number of tins needed

$\frac{14}{3}$ ← To multiply fractions: multiply the numerators and multiply the denominators

5 ← To convert the fraction to a decimal: the numerator can be divided by the denominator. 3, 6, 9, 12, 15... so 4 lots of 3 go into the 14 with a remainder, so 5 tins are needed to have more than enough and for there to be a whole number of 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]

100 - 15 ← Percentage is out of 100. So subtracting the 15% black fur from 100% finds that 85% is white fur

15 : 85 ← Expressing the ratio of black fur to white fur

$5\overline{)8\ ^{3}5}$ (1 7) ← Dividing both side by 5 simplifies the ratio to 3 : 17

3 : 17 ← This cannot go any simpler as 3 and 17 cannot be divided by the same amount to get smaller whole numbers

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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.

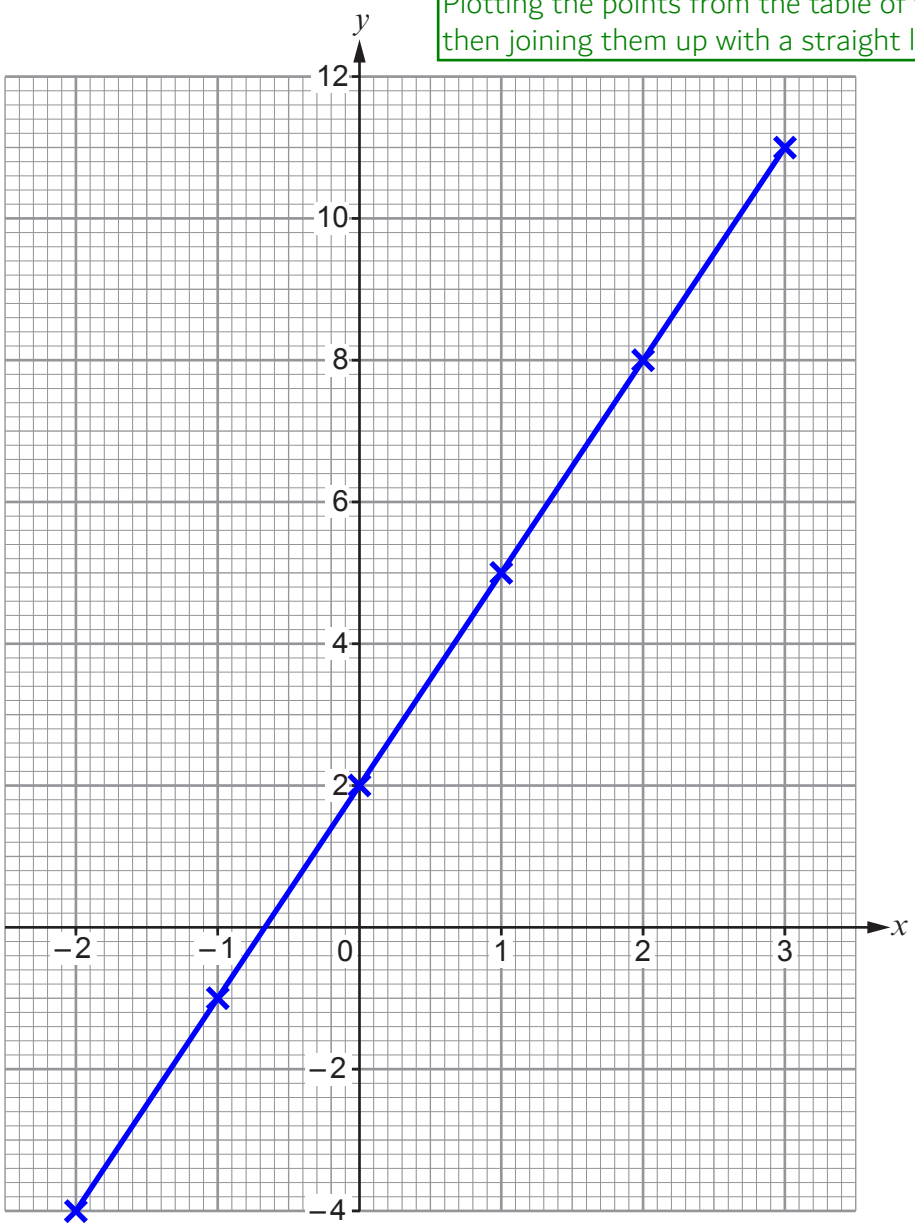
x	–2	–1	0	1	2	3
$y = 3x + 2$	-4	– 1	2	5	8	11

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

Substituting the x values into the right side of the equation finds the y values.
3(-2) + 2 = -6 + 2 = -4. 3(1) + 2 = 3 + 2 = 5. 3(3) + 2 = 9 + 2 = 11

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

Plotting the points from the table of values then joining them up with a straight line



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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.

Peter says,

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

Show that Peter is correct. [2]

$10 - 7 = 3$ ← Subtracting the 7 hours Tom works from the 10 hours Peter works finds that Peter works 3 more hours than Tom

$7 + 8 + 10$ ← Adding all the hours they work finds that they work 25 hours in total

$\frac{3}{25} = \frac{12}{100} = 12\%$ ← Peter works 3 out of the 25 hours more than Tom. Expressing this as a fraction. Multiplying both the numerator and denominator by 4 gives 12/100, which is 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]

$P : T : M = 1 : 2 : 4$ ← Writing the ratio of Peter : Tom: Molly. Peter works the least so letting 1 part of the ratio represent Peter. This is half of Tom's so 2 parts must represent Tom. Molly is twice Tom so 4 parts must represent Molly

$1 + 2 + 4$ ← Adding all the parts of the ratio finds that there are 7 parts in total in the ratio

$70 \div 7$ ← Dividing the total £70 by the 7 parts in total in the ratio finds that 1 part of the ratio is worth £10

10×4 ← Multiplying the value of 1 part of the ratio by 4 finds that the 4 parts representing Molly is £40

Molly should receive £ 40

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

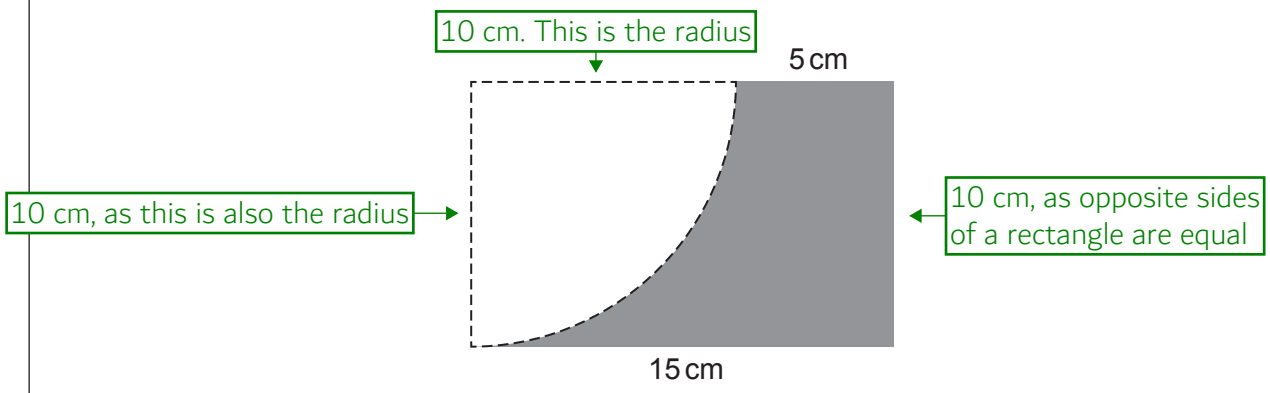

Diagram not drawn to scale

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

15 - 5 ← Subtracting the 5 cm from the 15 cm finds that the radius of the quarter circle is 10 cm

15 + 5 + 10 = 30 ← Adding the straight sides of the card finds that they add up to 30 cm

2 × π × 10 ← Circumference = 2 × π × radius. So the circumference of the full circle would be 20π cm

20π ÷ 4 ← The curve is 1/4 of the circumference of the full circle, so is 5π cm

Perimeter of the remaining piece of card is 5π + 30 cm

The perimeter is found be adding all the outside sides

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

m + 4 = 0 ← Anything to the power of 0 is 1. So m + 4 must be 0 as $3^0 = 1$

m = -4 ← Subtracting 4 from both sides gets m on its own

(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]

20 - 2c - 1.5d > 0

Subtracting the cost of the cakes and the cost of the doughnuts from the £20 leaves the change, which must be greater than 0 as there is some change. Multiplying the c cakes by the £2 expresses the cost of the cakes. Multiplying the d doughnuts by the £1.50 expresses the cost of the doughnuts

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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.

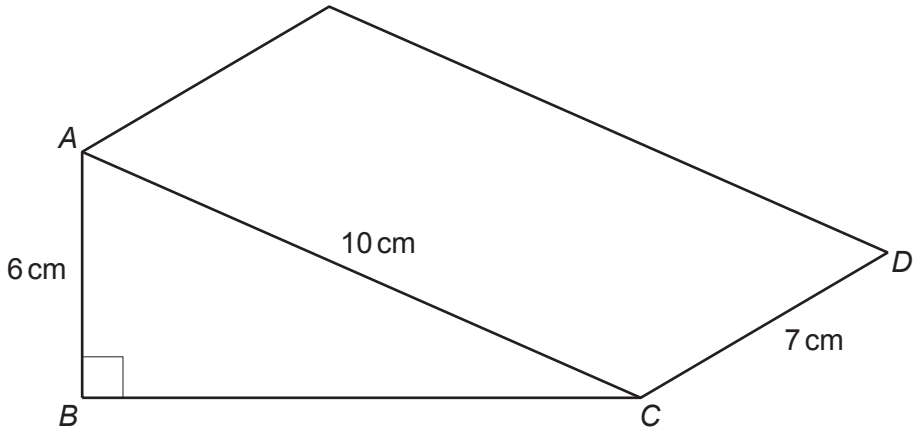

Diagram not drawn to scale

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

$BC^2 + 6^2 = 10^2$ ← Using Pythagoras' Theorem in the right-angled triangle ABC to find BC. $a^2 + b^2 = c^2$, where a and b are the shorter sides and c is the longest side

$BC^2 = 100 - 36$ ← Subtracting 6^2 from both sides gets BC^2 on its own. $10^2 = 100$ and $6^2 = 36$

$BC = \sqrt{64}$ ← 100 - 36 = 64. Then square rooting both sides finds that BC = 8 cm

$8 \times 7 = 56$ ← Area of the base rectangle

$7 \times 6 = 42$ ← Area of the left rectangle

$10 \times 7 = 70$ ← Area of the top rectangle

Area of rectangle = base × height

$4 \times 6 = 24$ ← Area of triangle = 1/2 × base × height. The base is 8 cm and the height is 6 cm. 1/2 × 8 = 4

$$\begin{array}{r} 56 \\ +\ 42 \\ +\ 70 \\ +\ 24 \\ +\ 24 \\ \hline 216 \\ {\scriptstyle 1} \end{array}$$

← Adding the areas of all three rectangles and both triangles gives the surface area

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

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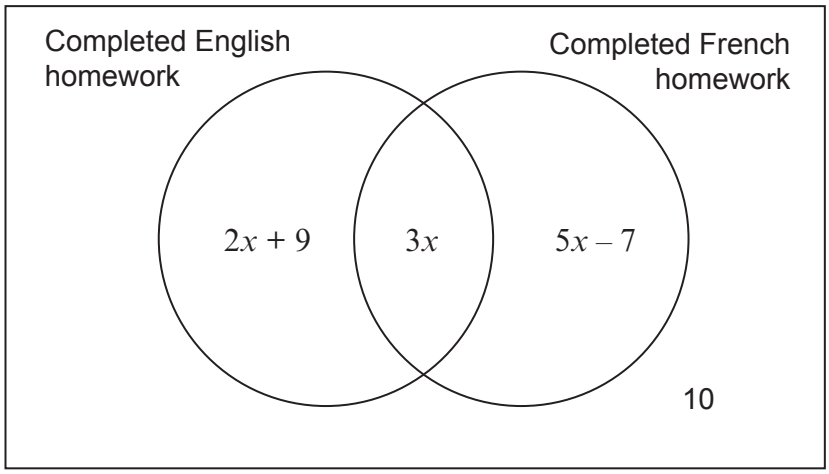
23. Last week, 142 pupils in Year 7 were given English homework and French homework.

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]

$2x + 9 + 3x + 5x - 7 + 10$ ← Adding all the expressions in the Venn diagram gives the total number of pupils

$10x + 12 = 142$ ← Collecting like terms and setting it equal to the 142

$10x = 130$ ← Subtracting 12 from both sides gets the x term on its own

Dividing both sides by 10 gets x on its own

$x =$ 13

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

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

$13 \times 5 = 65 - 7$ ← Substituting 13 for x in 5x - 7 finds that there are 58 pupils who completed only the French homework

58 out of the 142 pupils completed only the French homework

The probability that a pupil completed **only** the French homework is $\frac{58}{142}$

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

$\frac{1}{0.4} = \frac{10}{4}$ ← Reciprocal can mean to do 1 over. So the reciprocal of 0.4 is 1/0.4. Multiplying both the numerator and denominator by 10 gives 10/4

$4\overline{)10.20}$ = 2.5 ← Dividing the numerator by the denominator converts the fraction to a decimal

2.5

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

$\frac{3^3 + \sqrt{4 \times 9}}{0.3}$ ← Rounding each number to 1 significant figure. 3.02 rounds to 3. 4.17 rounds to 4. 8.9 rounds to 9. 0.289 rounds to 0.3

$27 + 6$ ← Simplifying the numerator. $3^3 = 27$. $4 \times 9 = 36$ then square rooting gives 6

$\frac{33}{0.3} = \frac{330}{3}$ ← 27 + 6 = 33 so it simplifies to 33/0.3. Multiplying both the numerator and denominator by 10 gives 330/3

$3\overline{)330} = 110$ ← The numerator can be divided by the denominator to get a whole number so it cannot be left as a fraction

110

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25.

Use:

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

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]

$0.05 = \frac{6.2}{A}$ ← Substituting the known values in the formula. Letting A be the area

$0.05A = 6.2$ ← Multiplying both sides by A so that it is not a denominator

$A = 124$ ← Dividing both sides by 0.05 gets A on its own. So the area of the base of the cuboid is 124 cm^2

$L \times 8 = 124$ ← The base of the rectangle is a rectangle. Area of rectangle = length × width

Dividing both sides by 8 finds that L = 15.5. This is the length

Length of the base of the cuboid = ... 15.5 ..... cm

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

$-32 - -35$ ← $a^x \div a^y = a^{x-y}$. So the indices should be subtracted

$-32 + 35$ ← Subtracting a negative is double negative so it becomes a positive

$35 - 32 = 3$ ← The -32 and 35 can be switched. So it must simplify to 5^3

25×5 ← $5^3 = 5 \times 5 \times 5 = 25 \times 5 = 125$

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]

$$\begin{array}{r} 24 \\ \times\ 5 \\ \hline 1\underset{2}{2}0 \end{array}$$

Multiplying the 24 hours by the 5 workers finds that it is 120 hours worth of work to do 180 m of the wall

$$\frac{120}{180} = \frac{12}{18} = \frac{2}{3}$$

Putting the 120 hours over the 180 m expresses the fraction of an hour it takes to do 1 m of the wall. Simplifying it to 2/3 of an hour

$300 \div 3$

100×2

Multiplying the 300 m by the 2/3 finds that it is 200 hours worth of work to do the 300 m of wall. To multiply by a fraction: divide by the denominator then multiply the result by the numerator

$$\begin{array}{r} 0\ 2\ 5 \\ 8\,\overline{)\,2\ {}^{2}0\ {}^{4}0} \end{array}$$

Dividing the 200 hours worth of work by the 8 workers finds that it would take 25 hours

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]

They all work at the same rate

The 8 workers could possibly work slower or faster than the 5 workers. It was assumed that they work at the same rate

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

It could be different

If the 8 workers do not work as fast as the 5 workers, it will take more time. If the 8 workers work faster than the 5 workers, it will take less time

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Question number	Additional page, if required. Write the question number(s) in the left-hand margin.

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