Eduqas WJEC | F | 16th May '24 | 1

Examiner only

Answer **all** questions.

1. (a) Write down the value of 2 in the number 1·27. [1]

0·2 or $\frac{2}{10}$

(b) Write 32 928 correct to the nearest 1000. [1]

33000

(c) Write down the value of 8^2. [1]

$8 \times 8 = 64$

(d) Calculate 20 + 4 ÷ 4. [1]

$20 + 1 = 21$

(e) Calculate 0·4 + 0·21. [1]

$$\begin{array}{r} 0.40 \\ +\ 0.21 \\ \hline 0.61 \end{array}$$

(f) Write these numbers in order of size. Start with the smallest number. [1]

5 −7 3·2 −7·5

−7·5 −7 3·2 5

Smallest Largest

(g) Write the following inequality in words. [1]

$-4 < x$

−4 is less than x

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2. Lewis has a bag containing 10 coloured counters.
He chooses one counter from the bag at random.

(a) There is an even chance that Lewis chooses a blue counter.
How many blue counters are there in his bag? [1]

5

(b) It is impossible for Lewis to choose a red counter.
How many red counters are there in his bag? [1]

0

(c) It is unlikely that Lewis chooses a yellow counter.
What is the smallest number of yellow counters that Lewis could have in his bag? [1]

1

3. (a) Write $\frac{3}{50}$ as a percentage. [1]

$= \frac{6}{100} = 6\%$

(b) Calculate $\frac{3}{5}$ of 20. [2]

$20 \div 5 = 4$

$4 \times 3 = 12$

(c) Calculate 70% of 50. [2]

$10\% = 5$

$\times 7 = 35$

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4. (a) Kelly is planning a family trip to the zoo.

The 2 adults and 3 children will all travel in the same car.
Each person will need an entrance ticket and lunch.

The costs for the trip are:

Petrol	£40
Tickets to the zoo	£15 per adult £10 per child
Lunch	£12 per adult £7 per child

$15 \times 2 = 30 \quad 30 > 60$
$10 \times 3 = 30$
$12 \times 2 = 24 \quad 24 > 45$
$7 \times 3 = 21$

Kelly has £180 to spend on the trip.
She pays for the petrol, the tickets and the lunches.
How much money will she have left? [4]

$$\begin{array}{r} 60 \\ +\ 45 \\ +\ 40 \\ \hline 145 \end{array}$$

$$\begin{array}{r} {}^{7}\not{1}{}^{1}\not{8}0 \\ -\ 145 \\ \hline 35 \end{array}$$

Kelly has 35 left.

(b) Last year, 10% of visitors to the zoo bought a bag of animal feed.

This year the zoo expects 650 000 visitors.
How many bags of animal feed do they expect to sell this year? [2]

$650000 \div 10$
$= 65000$

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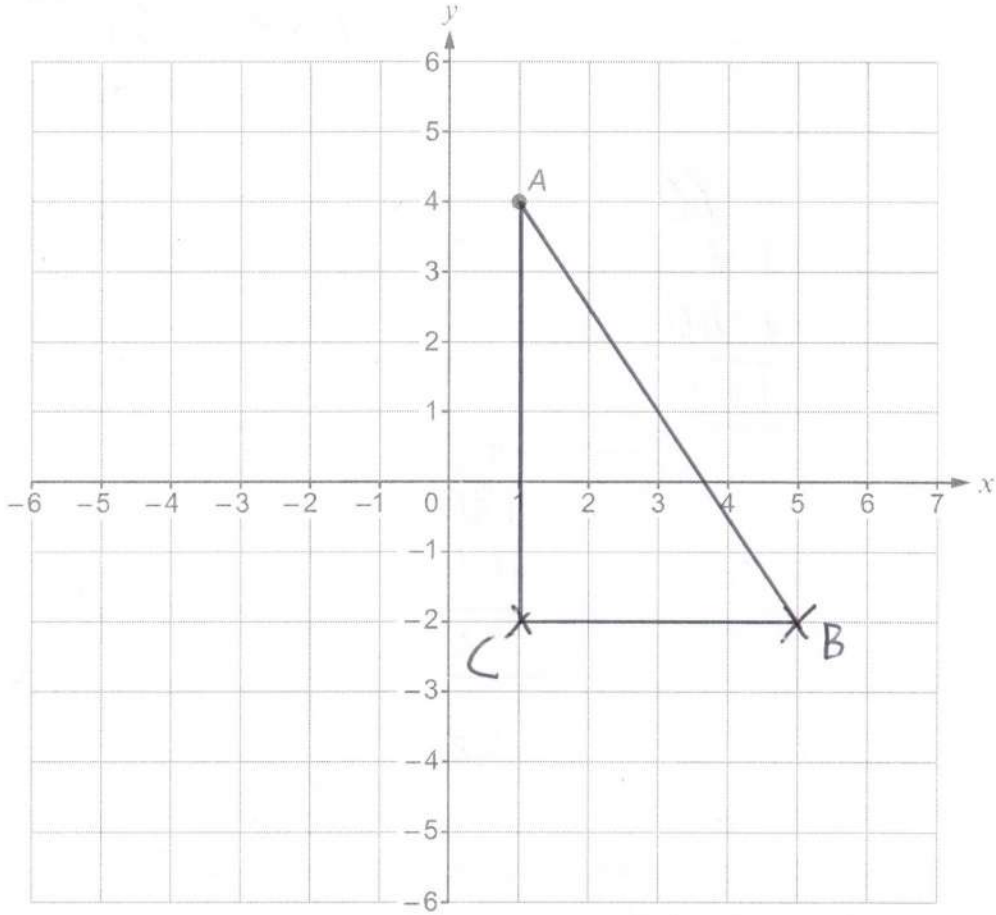
5. (a) Circle the expression that is the same as '4 more than y'. [1]

$y-4$ $\quad$ $4+y$ $\quad$ $\frac{4}{y}$ $\quad$ $4y$ $\quad$ $\frac{y}{4}$

(b) Calculate the value of $-8x$ when $x = -3$. [1]

$-8 \times -3 = 24$

6.



(a) On the grid, plot the point B (5, –2). [1]

(b) ABC is a triangle with a right-angle at C.
Plot the position of the point C. [1]

(c) Find the coordinates of the midpoint of the line AB. [2]

Coordinates of the midpoint of line AB are (3 , 1)

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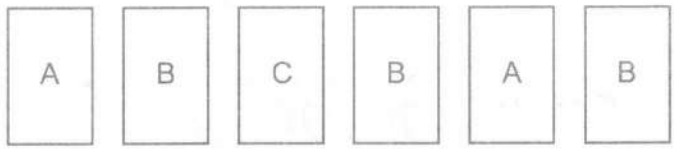
7. David has 6 cards.
Each card has a letter on it.



(a) Which letter is the mode? [1]

B

(b) One of the cards is chosen at random.

(i) On the probability scale below, mark with an arrow (↓) the probability that the card chosen has a letter A on it. [1]

(ii) Write down the probability that the card chosen has a letter C on it. [1]

1/6

(c) Write down the ratio of the number of cards with a letter A to the number of cards with a letter B. [1]

A : B = 2 : 3

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8. (a) Simplify $4 \times w \times 3 \times y$. [1]

12wy

(b) In **each** of the spaces below, write a term to make the statement correct. [1]

$f +$ 7f $-$ 2f $= 6f$

(c) Solve each of the following equations.

(i) $6x = 48$ [1]

$x = \frac{48}{6} = 8$

(ii) $\frac{a}{4} = 40$ [1]

$a = 40 \times 4 = 160$

(d) Twowheels is a bike hire company.
Customers can hire bikes from Twowheels for a whole number of days.

The company uses the following formula to calculate its hire costs.
Bike hire cost = £20 + £15 × number of hire days
Tom wants to hire a bike from Twowheels.
He has £150 to spend.

What is the greatest number of days for which Tom can hire a bike? [3]

$150 - 20 = 130$

$15 \times 8 = 120$

Tom can hire a bike for 8 days

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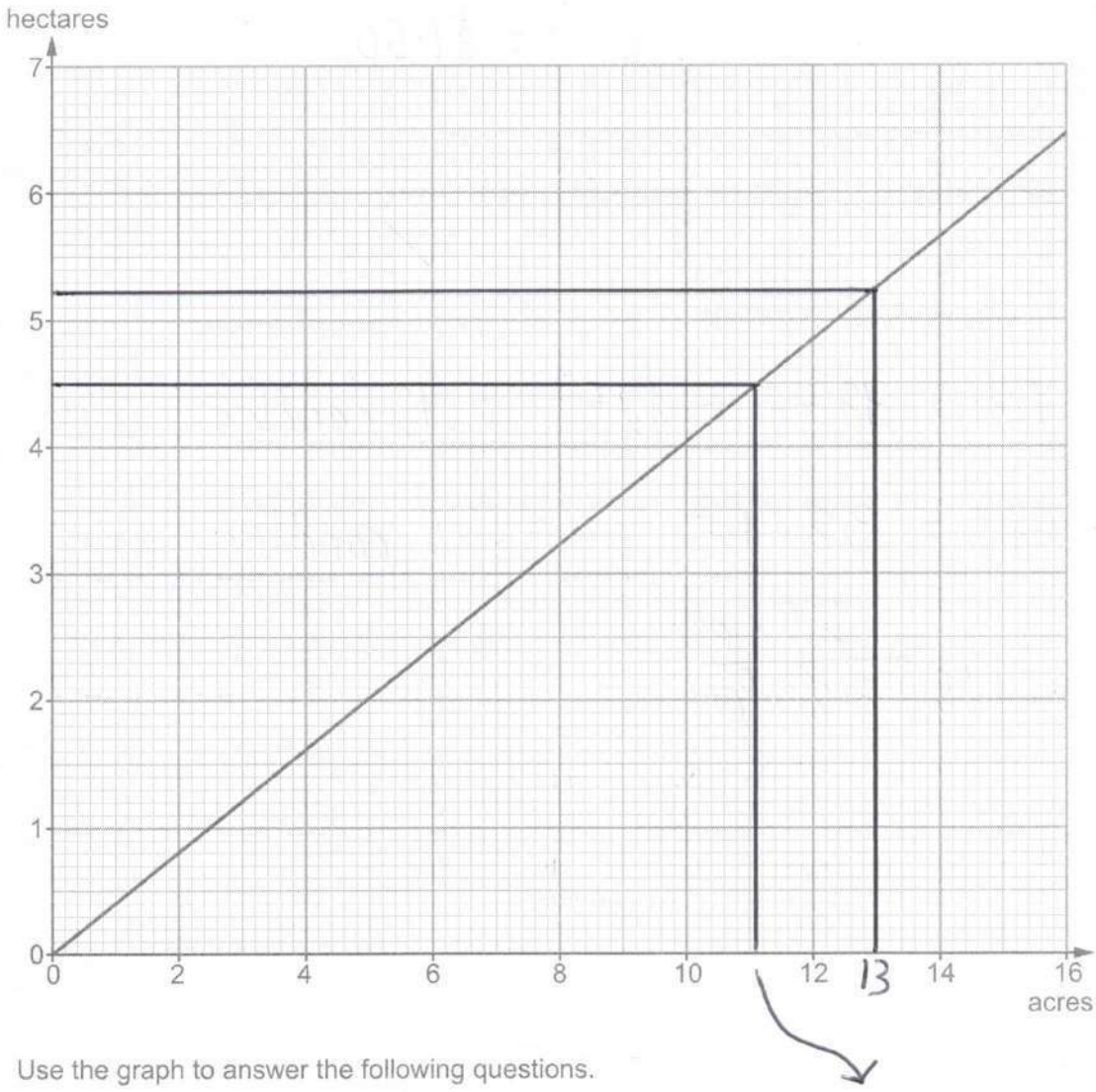
9. The conversion graph below can be used to convert between acres and hectares.



Use the graph to answer the following questions.

(a) How many acres are equal to 4·5 hectares? [1]

11·1 (ish)

[ms: 11·0 → 11·2]

(b) Complete the following statement.
You must show all your working. [2]

26 acres is equal to 10·4 hectares.

2 x 5·2 =

[ms: 10·4 → 10·6]

C300U101
03

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10. A shop that sells scented candles is holding a sale.
The original price of each candle was £3.

In the sale, the candles are sold at half price. = £1·50
Sam has £38.
Sam thinks that the maximum number of candles that she can now buy is exactly twice as many as she could buy at the original price.

Is Sam correct?

☐ Yes ☑ No

You must explain your reasoning. [2]

Full = 38 ÷ 3 = 12 r 2 = 12 candles

Half = 38 ÷ 1·5 = 25 candles

$$15\overline{)380^{8}.^{5}0} \quad 25\text{·etc}$$

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11. Here is part of a train timetable between London Paddington and Bristol Parkway.

	London Paddington	~~18:01~~	~~18:18~~	18:43	19:18	19:48	20:01
	Reading		18:43	19:10	19:43	20:13	
	Swindon		19:10	19:37	20:10	20:40	
	Bristol Temple Meads	19:30					21:34
	Bristol Parkway	19:46	19:51	19:59	20:31	21:01	21:56

(a) Darren catches the 19:48 train from London Paddington to Bristol Parkway.
How many **minutes** should his train journey take? [2]

12 + 60 + 1 = 73mins

(b) Jennifer lives in London.
She went to an event in Swindon.

Jennifer left her house at 6:10 p.m. ✓
It took her 10 minutes to get to London Paddington station. 6:20
She then took the next train to Swindon. ✓
This train arrived in Swindon on time. ✓ 19:37
It then took her 12 minutes to get to the event. 19:49

The event started at 7:45 p.m.
How many minutes late did Jennifer arrive at the event?
You must show your working. [3]

Jennifer arrived 4 minutes late

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12. (a) Lisa, Flynn and Jane each have a number of marbles.

Jane has 8 marbles.

Jane has half as many marbles as Flynn.
Flynn has 4 times as many marbles as Lisa.

Write the numbers of marbles they each have as a ratio.
Give your answer in its simplest form. [2]

L F J
4 16 8

Lisa : Flynn : Jane = 1 : 4 : 2

(b) Siân is trying to write 2 m to 30 cm as a ratio in its simplest form.
Here is her working.

2 m : 30 cm

1 m : 15 cm

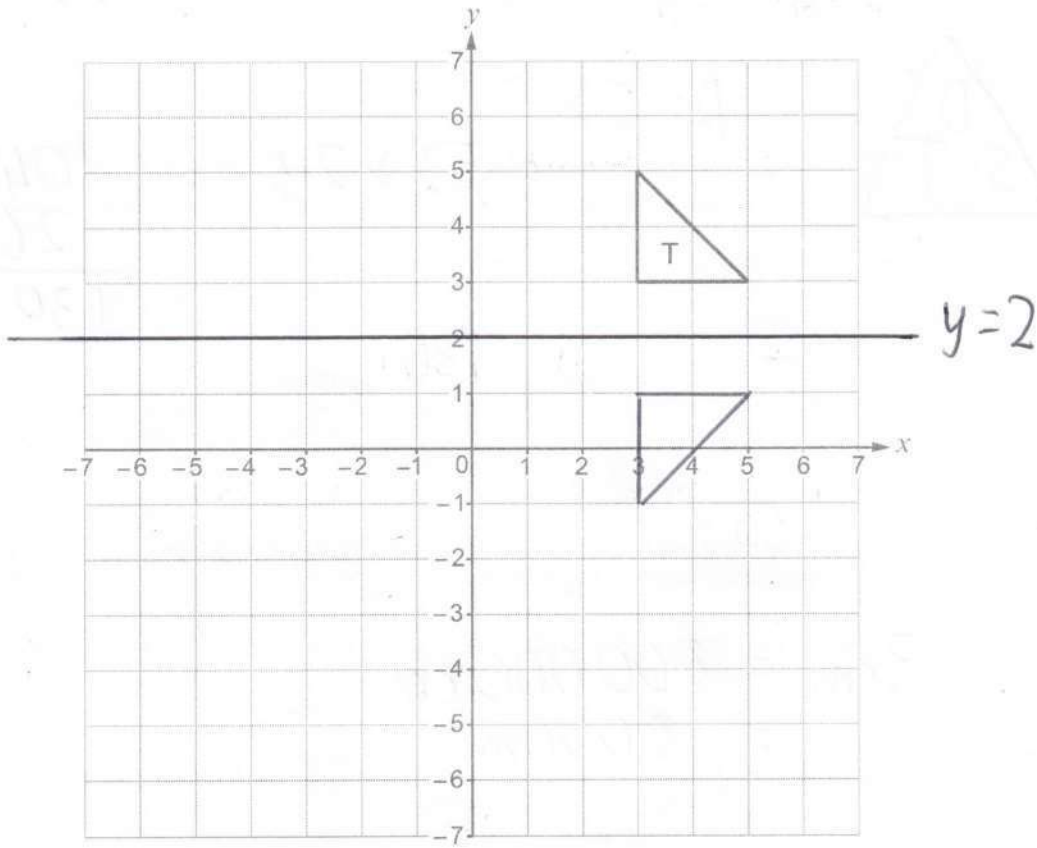
Answer: 1 : 15

Explain why Siân's answer is **not** correct. [1]

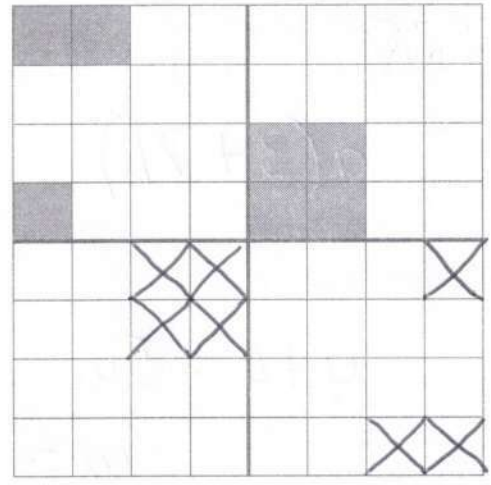
Should convert first eg 200cm : 30cm
20 : 3

Examiner only

13. (a) Reflect the triangle T in the line $y = 2$. [2]



(b) Shade the least number of squares in the lower two quadrants so that the grid has rotational symmetry of order 2. [2]



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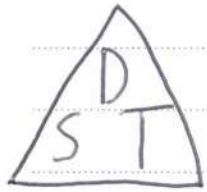
14. (a) Suzanne drives from Liverpool to Hull.
She drives at an average speed of 52 miles per hour for $2\frac{1}{2}$ hours. $= 2.5$
Calculate the distance that Suzanne travels. [2]



$D = S \times T$

$= 52 \times 2.5 = 104$

26

130

Suzanne travels 130 miles

(b) Suzanne planned her journey using a map.
The map has a scale of 1:200 000.

On the map, the distance between two roundabouts measures 3 cm.
What is the actual distance in **kilometres**? [3]

$3\text{cm} = 600000\text{cm}$

$= 6000\text{m}$

$=$

The actual distance is 6 km

15. (a) Factorise $3a + 7ab$. [1]

$a(3 + 7b)$

(b) Make w the subject of the formula $y = 5w - 4$. [2]

$y + 4 = 5w$

$w = \frac{y+4}{5}$

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16. In the diagram below, *BE* is a straight line.

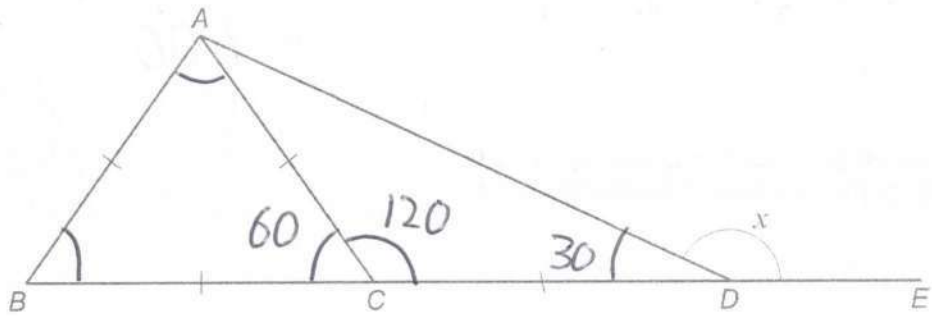

Diagram not drawn to scale

Show that $x = 150°$.
You must give a reason for each step of your working. [4]

ABC = equilateral so all angles = 60

$\angle ACD = 120$ (angles on a line sum to 180)

$\angle ADC = \frac{180-120}{2} = 30$ (base angles of isosceles are equal)

$x = 150$ (line sums to 180 again)

Examiner only

17. (a) Calculate 0·4 ÷ 0·01. [1]

$= 40 \div 0.1 \quad = 40 \div 1$

$= 40$

(b) Calculate each of the following.
Give your answers in their simplest form.

(i) $\frac{1}{4} + \frac{3}{5}$ [2]

$\frac{5}{20} + \frac{12}{20} = \frac{17}{20}$

(ii) $\frac{5}{6} \times \frac{3}{10}$ [2]

$= \frac{15}{60} = \frac{1}{4}$

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18. The diagram below shows rectangle *ABCD*.

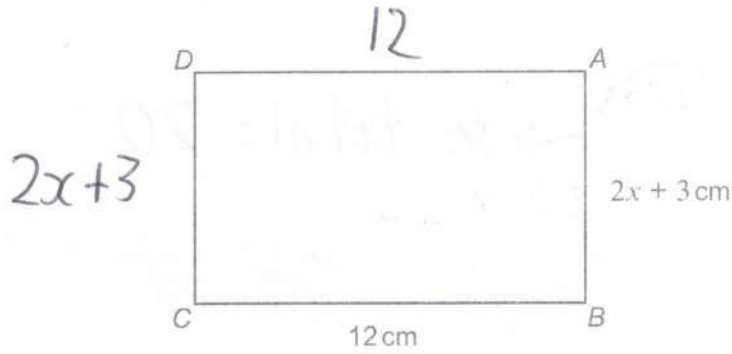

Diagram not drawn to scale

$AB = 2x + 3$ cm and $BC = 12$ cm.

The perimeter of the rectangle is 40 cm.
Calculate the value of x. [4]

$P = (12 \times 2) + 2(2x+3) = 40$

$= 24 + 4x + 6 = 40$

$4x = 10$

$2x = 5$

$x = 2.5$

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19. Write down five positive whole numbers in the boxes below such that the numbers have:

- a range of 5 **and**
- a mean of 4 **and**
- a median of 3.

[3]

✓

so total = 20

2	2	3	6	7

or 2 3 3 5 7

or 3 3 3 3 8

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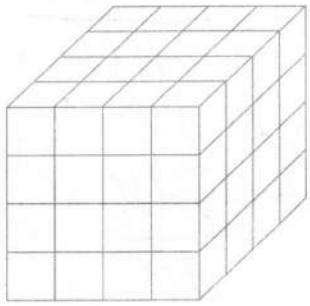
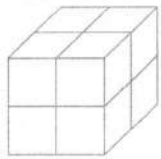
20. Robin makes the two cubes below from centimetre cubes.

64=





= 8

Diagram not drawn to scale

Sarah uses **all** of Robin's centimetre cubes to make a **single** cuboid.

Each of the dimensions of Sarah's cuboid will be greater than one centimetre.

Give the dimensions of a cuboid that Sarah could make. [2]

Sarah has 72 cubes

9 8

3 3

so 8 x 3 x 3

or 12 x 3 x 2 etc

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21. (a) **Estimate** the value of $\frac{2{\cdot}13 \times 99{\cdot}4}{39{\cdot}5}$.

You must show all your working. [2]

$= \frac{2 \times 100}{40}$

$= \frac{200}{40} = 5$

(b) Given that $3{\cdot}4 \times 7{\cdot}8 = 26{\cdot}52$, write down the answer to each of the following:

(i) 34×78 [1]

2652

(ii) $\frac{26{\cdot}52}{34}$ [1]

0·78

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22. (a) Write 2475 as a product of its prime factors in index form. [3]

$$5\overline{)2475}\quad 495$$

$$5\overline{)495}\quad 99$$

2475 → 495, 5 → 99, 5 → 9, 11 → 3, 3

$$= 3^2 \times 5^2 \times 11$$

(b) Write down the square root of $64 \times 5^4 \times 7^4$.
Give your answer as a product of prime factors in index form. [2]

$$64 = 2^6$$

$$= 2^3 \times 5^2 \times 7^2$$

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23. Pippa and Joe are working on a school project.
The project is based on the use of the local leisure facilities.

(a) Pippa decides to ask adults how much they spend on gym membership each month.
In the box below, write a suitable question with appropriate response boxes to collect this information. [2]

Question
How much do you spend on your gym membership per month

Response boxes
Less than £10 ☐, £10 → £25 ☐, over £25 ☐

(b) Joe asked some adults how many hours they each spent at the leisure centre during the previous week.
His results are shown below.

Number of hours	0–4	5–9	10–14	15–19	20–24
Number of adults	9	2	1	1	2

Joe accurately calculated an estimate of the mean time spent per adult to be 7 hours.

In his project he stated:

'On average, the adults in my survey each spent 7 hours at the leisure centre last week.'

(i) Explain why the mean is not the best average to use for this data. [1]

The outliers skew the data

(ii) Give **one** other reason why Joe's results may not be reliable. [1]

Small sample

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24. An empty water tank is filled using a hose with a steady rate of flow.

The tank takes:

- 30 minutes to fill if water is added at x litres/min
- 40 minutes to fill if the water is added at $(x-2)$ litres/min.

Form an equation in terms of x.
Solve the equation and hence find the capacity of the tank in litres. [5]

$30x = 40(x-2)$

$30x = 40x - 80$

$80 = 10x$

$8 = x$ Capacity $= 30 \times 8$

$= 240$

25. Three friends, Louis, Krystal and Jamal win some money in a competition.
They share the money in the ratio 3 : 7 : 11.

(a) What fraction of the total money won is given to Jamal? [1]

$\frac{11}{21}$

(b) **Jamal** spends £45 of the money he won.
He now has exactly twice as much as **Louis** won.
How much money did **Krystal** win? [3]

L	K	J
3	7	11 → becomes "6"

5 parts = £45

−45 1 pt = £9

K = 7 × 9 = £63

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26. 6 printers take 36 minutes to print a number of identical booklets.
How long will it take 9 printers to print **half** as many of these booklets?
You may assume that all printers print at the same rate. [3]

36
X36
216 work needed $\frac{1}{2} = 108$

$108 \div 9 = 12$

27. (a) The price of an item in a sale has been reduced by 25%.
If the sale price is £54, what was the original price of the item? [2]

$x \times 0{\cdot}75 = 54$ / 54 X14 216

$x \times \frac{3}{4} = 54$

72
3)216

£72

(b) Percentage change can be calculated using multipliers.

(i) A number is decreased by 33% of its value.
Circle the multiplier that would find the value after this decrease. [1]

(0·67) −1·33 −0·67 0·33 0·77

(ii) A number is increased by 6% of its value.
This is done 3 times, each time increasing the previous value by 6%.
Circle the multiplier that would find the value after the 3 increases. [1]

1·06 1·18 $(1{\cdot}06^3)$ 0·18 $0{\cdot}06^3$

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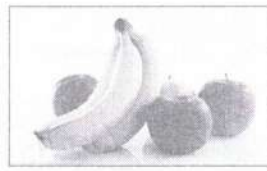
28. Three friends, Luka, Mali and Nina buy some fruit.



Luka buys 3 apples and 4 bananas and pays £2.70.
Mali buys 2 apples and 3 bananas and pays £1.95.

Use an algebraic method to calculate how much Nina pays for 4 apples and 2 bananas. [6]

$3a + 4b = 2.70$ (×2)
$2a + 3b = 1.95$ (×3)

$1.95 \times 2, 3 = 5.85$

$6a + 8b = 5.40$
$6a + 9b = 5.85$ (bottom − top)
$b = 0.45$

$0.45 \times 1, 3 = 1.35$

so $2a + 1.35 = 1.95$
$2a = 0.60$
$a = 0.30$

(N) $= 4a + 2b$
$= 1.20 + 0.90$

Nina pays £2.10

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29. (a) Calculate the value of $\frac{1{\cdot}29\times10^{5}}{3\times10^{-7}}$.

$5--7=12$

Give your answer in standard form. [2]

$0{\cdot}43$

$3\overline{)1{\cdot}29}$ $= 0{\cdot}43 \times 10^{12}$

$= 4{\cdot}3\times10^{11}$

(b) Calculate the value of $\left(7{\cdot}6\times10^{5}\right)+\left(3\times10^{4}\right)$.

Give your answer in standard form. [2]

760000

30000

790000 $= 7{\cdot}9\times10^{5}$

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