Eduqas - Foundation - Nov '24 - Paper 2

Examiner only

Answer **all** questions.

1. (a) Write the number half a million in figures. [1]

500,000 ✓

(b) Fill in the boxes to make each calculation correct. [3]

3765	−	780	=	2985	✓
53	×	27	=	1431	✓
1875	÷	25	=	75	✓

(c) Write either < or > in each empty box to make each statement true. [2]

6	<	15
0·34	<	0·7
−8	>	−11

✓✓all
✓2

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2. Part of the breakfast menu at a café is shown below.

Breakfast Menu	
Small breakfast	£4.85
Add extra items	
One egg	45p
One sausage	£1.50
One portion of tomatoes	79p
One portion of mushrooms	84p

(a) Ffion orders a small breakfast with one extra egg and one extra sausage.

(i) What is the total cost for this? [1]

$4.85 + 0.45 + 1.5 = £6.80$ ✓

(ii) Ffion is given a 10% discount on her order.
How much money will she save? [1]

$\div 10 = £0.68$ ✓

(b) Carl pays for three small breakfasts.
He pays with a £20 note.
How much change should he get? [2]

$20 - (3 \times 4.85) = £5.45$ ✓

✓

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(c) Catrin has a voucher to use at the café.

Voucher
A small breakfast plus two extra items:
Pay £6.50

She orders a small breakfast and two extra items.
Catrin uses her voucher instead of paying the usual price.

Will Catrin **definitely** save money?

Yes ☐ No ☑

Give the reason for your answer. [1]

Small breakfast + 2 eggs (or tams etc)
= 4·85 + 0·90
= 5·75

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05

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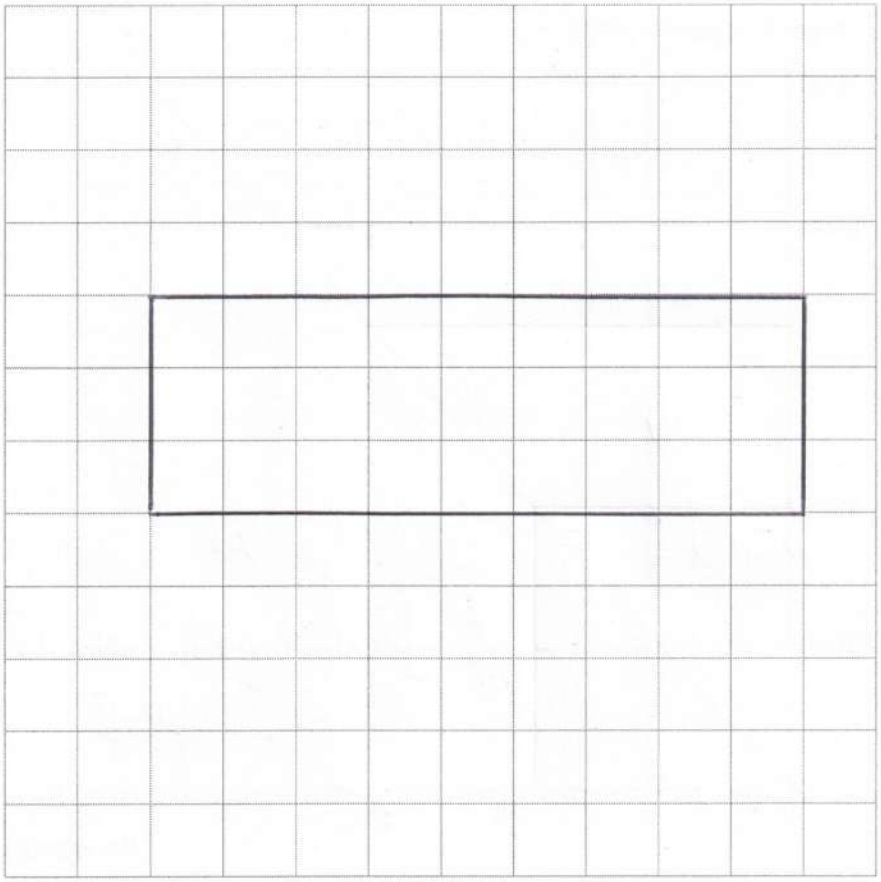
3. (a) On the 1 cm^2 grid below, draw a rectangle with an area of 27 cm^2. [1]



(b) Calculate the perimeter of the rectangle drawn in part (a). [1]

9+3+9+3

Perimeter = 24 cm

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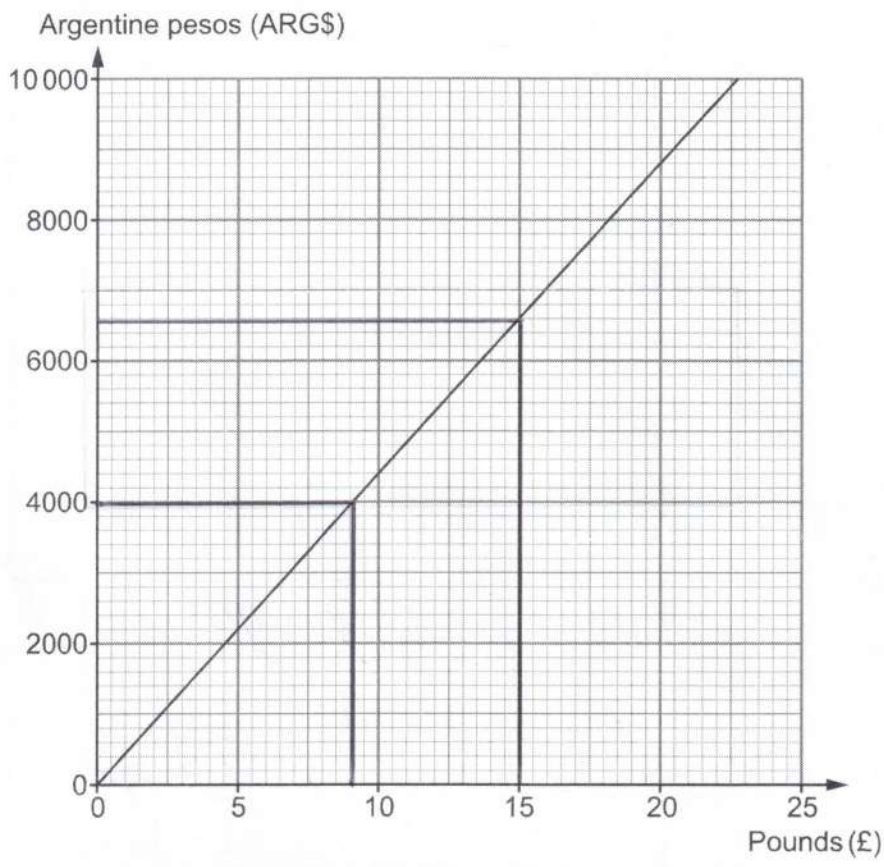
4. The graph below can be used to convert between pounds (£) and Argentine pesos (ARG$).



Use the graph to convert the following.

(a) £15 into Argentine pesos. [1]

6600 ✓

(b) 4000 Argentine pesos into pounds. [1]

£9

[ms 9 → 9·10]

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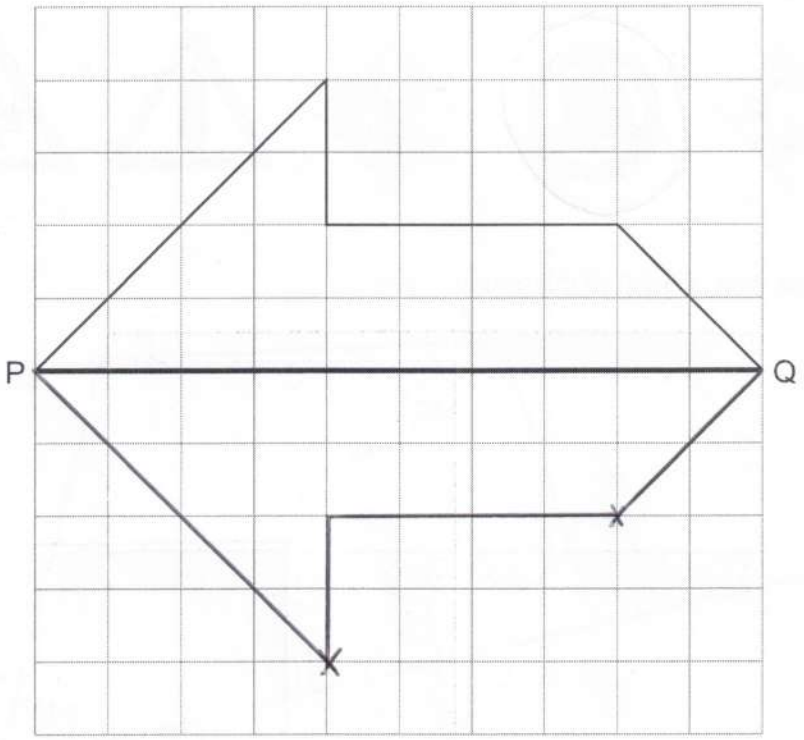
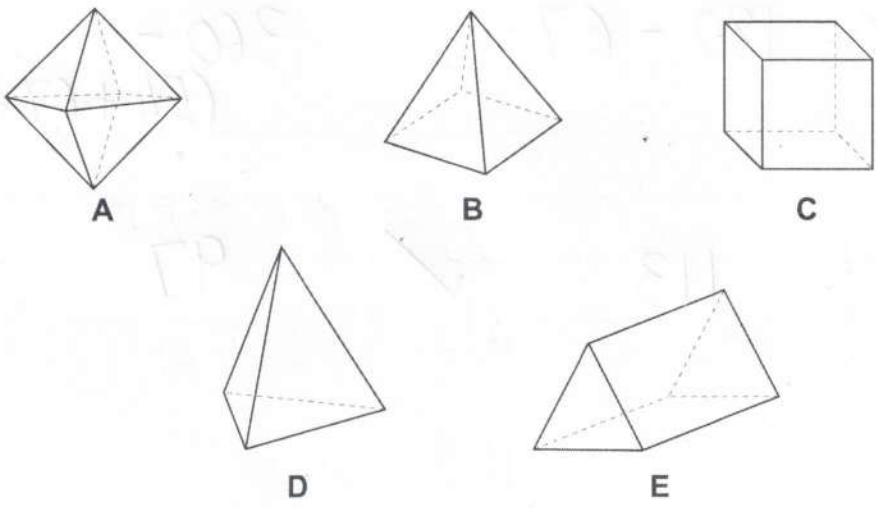
5. (a) Complete the shape so that PQ is a line of symmetry. [1]



(b) Some three-dimensional shapes are shown below.



Complete the following sentences using **A**, **B**, **C**, **D** or **E**.

(i) Shape C has twice as many edges as it has faces. [1]

(ii) Shape A has twice as many edges as it has vertices. [1]

(iii) The number of vertices is equal to the number of faces in shapes B and D. [1]

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(c) Circle the shape below that has rotational symmetry of order three. [1]

(d) Find the size of each of the angles x and y. [3]

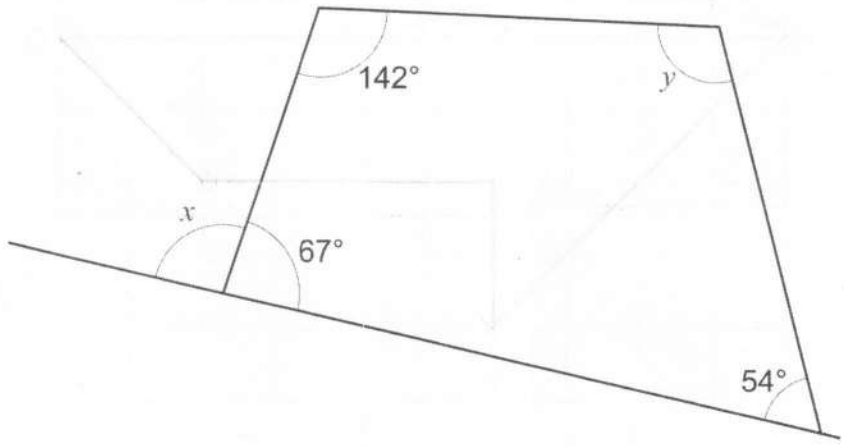

Diagram not drawn to scale

$x = 180 - 67$ $360 - (54 + 67 + 142)$

$x =$ 113 ° $y =$ 97 °

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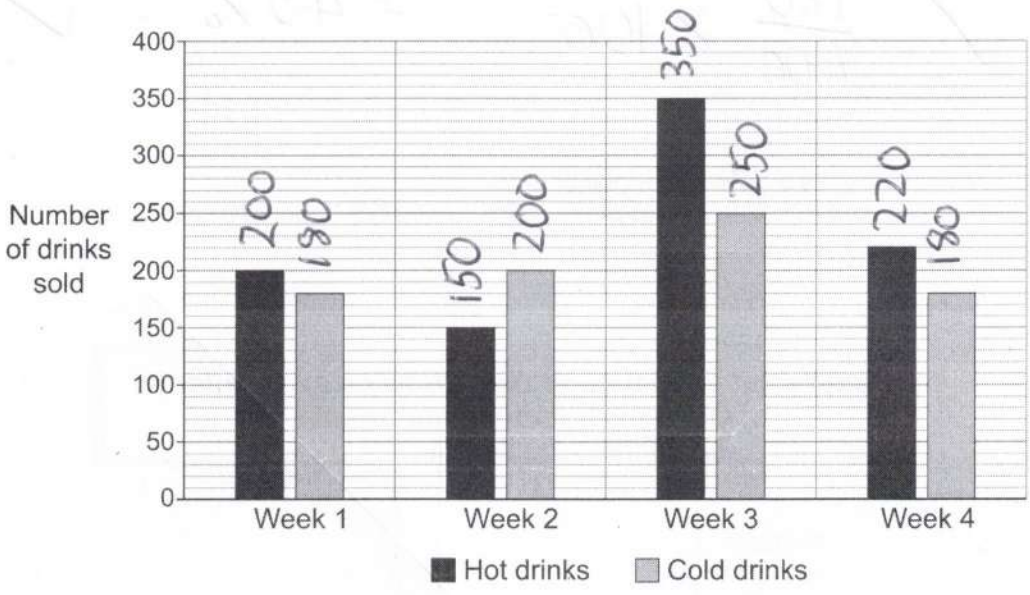
6. Jenny owns a drinks stand.
The graph below shows the number of hot and cold drinks that she sold over a four-week period.



(a) Each hot drink costs £2.80 and each cold drink costs £1.35.
What was the total income from selling drinks during **week 1**? [2]

$(200 \times 2{\cdot}80) + (180 \times 1{\cdot}35)$ ✓

$= £803$ ✓

(b) What was the ratio of hot drinks to cold drinks sold during **week 3**? [2]
Give your answer in its simplest form.

350 : 250

35 : 25 ✓

Hot drinks : Cold drinks = 7 : 5 ✓

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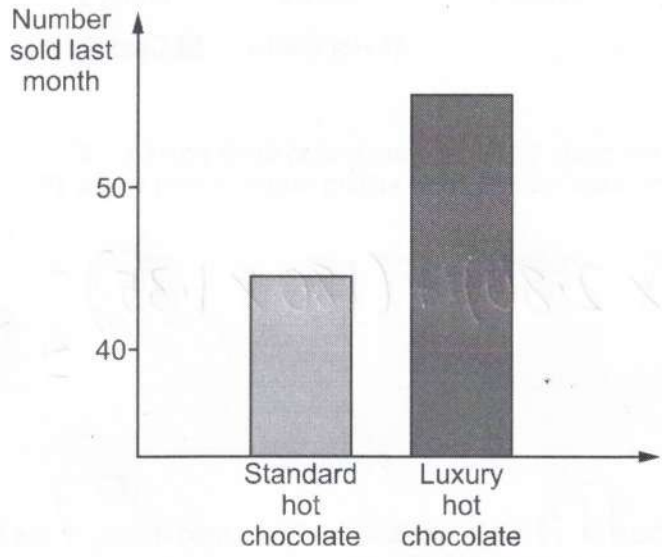
(c) What percentage of the drinks sold during **week 4** were cold drinks? [2]

✓ $\frac{180}{400} \times 100 = 45\%$ ✓

(d) Jonathan owns a different drinks stand.
He uses an advertisement to promote his luxury hot chocolate drink.
This is shown below.

Luxury hot chocolate drinks are twice as popular as standard hot chocolate drinks.



Explain why the advertisement is misleading. [1]

y-axis doesn't begin at 0 ✓
etc

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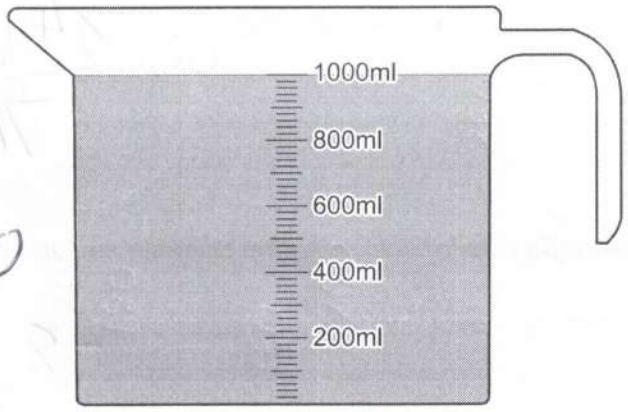
7. The diagram below shows jug A and the water it contains.

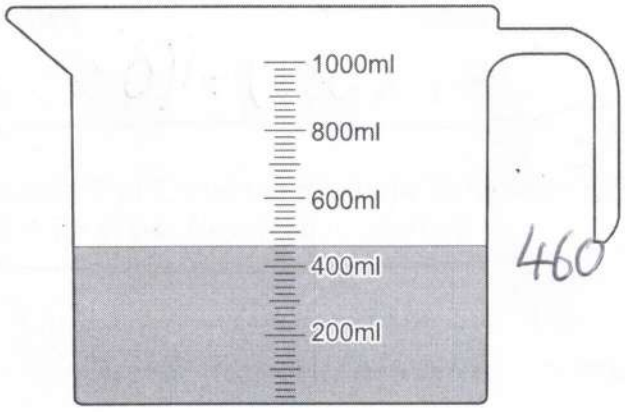
1000
÷4
= 250



(a) Jug B contains one quarter of the amount of water that is in jug A.
What is the **total amount** of water in the two jugs? [2]

1000 + 250 = 1250ml

(b) Some of the water from jug A is used to fill five empty cups.
The picture below shows the amount of water left in jug A.



460

(i) How much water has been **poured** from jug A? [2]

1000 - 460 = 540ml

(ii) The five cups each contain the same amount of water.
How much water is in each cup? [1]

540 ÷ 5 = 108ml

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8. (a) (i) Write down the **next term** in the following sequence. [1]

3, 12, 48, 192, ... ×4

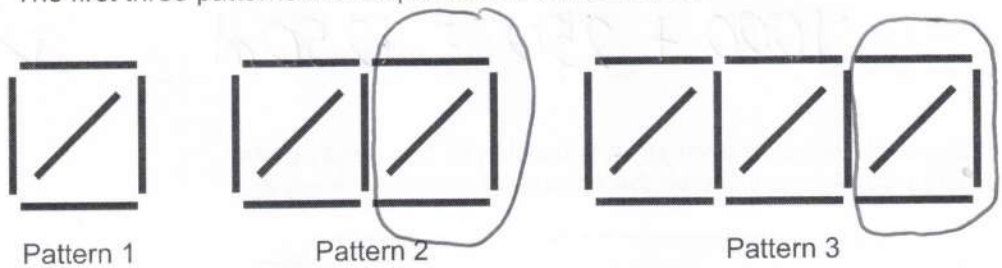
= 768 ✓

(ii) Write down **the rule** for continuing the following sequence. [1]

−3, −11, −19, −27, ...

−8 etc ✓

(b) Patterns are made using sticks.
The first three patterns in a sequence are shown below.



Pattern 1 Pattern 2 Pattern 3

Hugo says,

The number of sticks in pattern 7 is 35 because there are 5 sticks in pattern 1 and 5 × 7 = 35.

Is Hugo correct?

Yes ☐ No ☑ ✓

Give the reason for your answer. [1]

Only 4 sticks added each time

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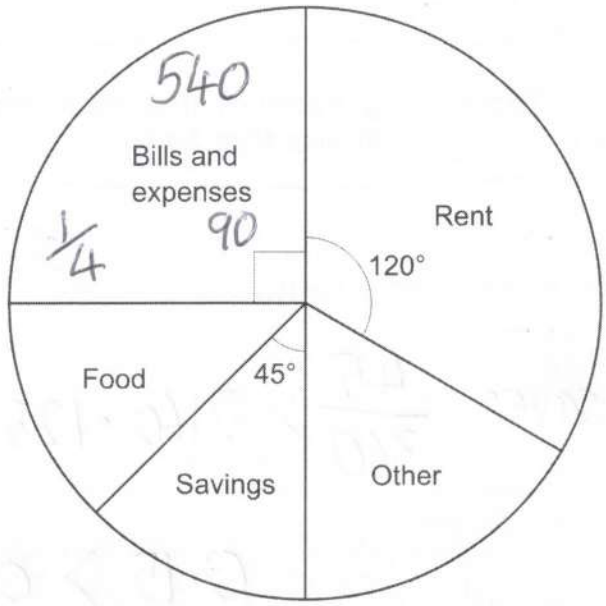
9. The pie chart below shows information about how Sadia spends her monthly income.



Sadia spends £540 a month on bills and expenses.

(a) What is her monthly income? [2]

540 × 4 = 2160 ✓

✓

(b) How much does Sadia spend on her rent each month? [2]

£540 = 90° (÷3) → £180 30° (×4) → Rent = 120°

180 × 4 = £720 ✓

 (C300U20-1)

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(c) Pietro saves 15% of his monthly income. $= 0.15$

He says,

I save a bigger proportion of my monthly income than Sadia.

Give calculations to show Pietro is correct. [2]

Sadia saves $\frac{45}{360} = 0.125$

$0.15 > 0.125$

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Examiner only

10. Zara makes necklaces by threading beads onto lengths of string.

(a) She uses a bag of beads that contains pink, yellow, green and blue beads.
In the bag:

- half of the beads are pink —
- there are half as many yellow beads as pink beads —
- there are an equal number of green beads and blue beads.

Zara selects a bead at random from the bag.

Complete the table below to show the probability of selecting each colour. [2]

Colour	Pink	Yellow	Green	Blue
Probability	0·5	0·25	0·125	0·125 ✓✓

$\frac{0·25}{2} = 0·125$

(b) Zara makes necklaces of two different lengths.
The length of string for each long necklace is y cm.
The string for each short necklace is 11 cm shorter than the string for a long necklace.

Write an expression, in terms of y, for the **total length** of string needed to make one long necklace and two short necklaces.
Simplify your answer. [3]

Long = y
Short = $y - 11$ ✓

$y + y - 11 + y - 11$

$= 3y - 22$ ✓✓

Examiner only

11. Jeff and Ava have a pack of numbered cards.

(a) Jeff selects the three cards shown below from the pack.

Jeff selects a fourth card.
The median of the numbers on his four cards is 7·5.

What number is on the fourth card? [2]

(7·5 x 2) - 6 M ✓

3, 6, —, 11

= 9 ✓

The number on Jeff's fourth card is 9

(b) Ava selects three cards from the pack.
The mean of the numbers on these three cards is 8.

Total = 24 ✓

Ava selects a fourth card.
The mean of the numbers on her four cards is 9·5.

What number is on the fourth card? [4]

(9·5 x 4) - 24 ✓✓

The number on Ava's fourth card is 14 ✓

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12. (a) Simplify $-8x + 5x - x$. [1]

$-4x$

(b) Use the formula S = 5R + 2T to find the value of R when S = 28·5 and T = −4. [3]

$28.5 = 5R + 2x-4$ ✓

$36.5 = 5R$ ✓

$R = \frac{36.5}{5} = 7.3$ ✓OE

(c) Expand $5(9 - 13y)$. [1]

$45 - 65y$ ✓

(d) Factorise $mt - 3t$. [1]

$t(m-3)$ ✓

(e) Solve $x^2 = 58$.
Give your answer correct to two decimal places. [2]

$x = \sqrt{58} = 7.615... = 7.62$ ✓✓

(±)

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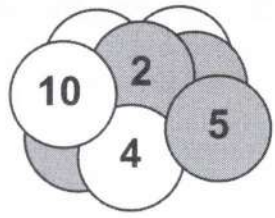
13. Four white discs and four grey discs each have whole numbers written on them.



In a game, the discs are turned face down.
A player chooses one white disc and one grey disc at random.
The player's score is calculated by dividing the bigger number by the smaller number.

(a) The table below shows some of the numbers on the discs and some possible scores. Complete all the missing entries. [2]

Grey disc \ White disc	1	4	6	10
12	12	3	2	1·2
5	5	1·25	1·2	2
4	4	1	1·5	2·5
2	2	2	3	5

Score

√√ All

√ 4/5

(b) To win the game, a player must get a score greater than 2.

(i) Dante plays the game once.
Calculate the probability that he wins the game. [1]

7/16 ✓

(ii) Jenna played the game 224 times.
How many games would you expect her to win? [2]

$224 \times \frac{7}{16} = 98$ ✓

✓

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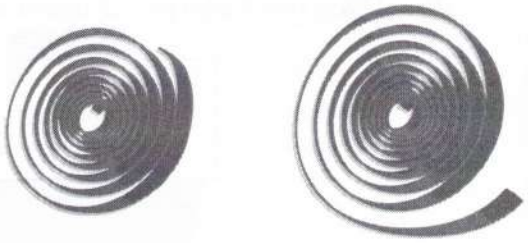
14. Daisy owns a sweet shop.



(a) She has two rolls of liquorice.
One roll has a length of 90 cm.
The other roll has a length of 144 cm.

Daisy wants to cut these rolls into smaller pieces of equal length.

What is the **maximum** possible length of these smaller pieces that leaves no left over liquorice? [3]

144 → 12 12 → 6 2 6 2 → 2 3 2 3

90 → 10 9 → 5 2 3 3

m ✓

HCF
= 2 x 3 x 3
= 18

m ✓

The maximum possible length of the smaller pieces is 18 ✓ cm

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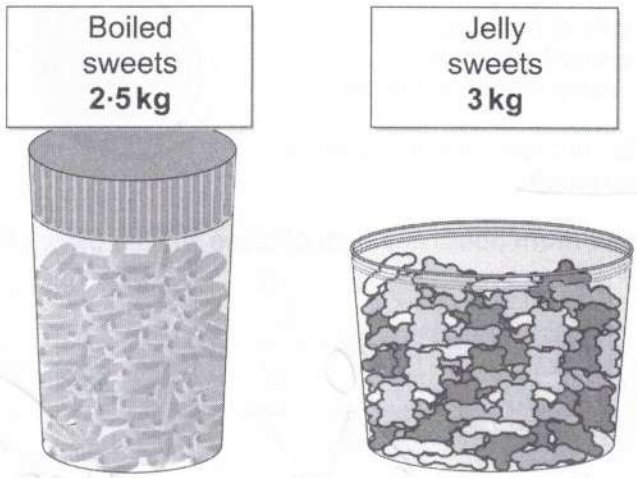
(b) Daisy has 2·5 kg jars of boiled sweets and 3 kg tubs of jelly sweets in her shop.



Half a kilogram of boiled sweets costs £4.25.
The total cost for one jar of boiled sweets and one tub of jelly sweets is £35.83.

What is the cost of 1 kg of jelly sweets? [4]

BS 0·5 kg = £4·25

×5 → 2·5 kg = £21·25 ✓

35·83 − 21·25 = £14·58 JS ✓
for 3 kg

14·58 ÷ 3 ✓

The cost of 1 kg of jelly sweets is £4·86 ✓

Examiner only

15. Dexter wants to buy a games console that costs £485.

Dexter can choose from two different options to pay for the console.

Option A	**Option B**
Pay a deposit and the remaining balance in the following ratio: Deposit : remaining balance = 1 : 4. The remaining balance to be paid in 8 equal monthly payments.	Pay a 12% deposit. The remaining balance to be paid in 10 equal monthly payments.

Dexter wants the monthly payments to be as low as possible after paying a deposit.
Which option should Dexter choose and how much will he pay each month?

You must show all your working. [7]

Option A

$485 \times \frac{4}{5} = £388$ ✓✓

$388 \div 8 = £48.50$ p/month ✓

Option B

$485 \times 0.88 = £426.80$ ✓

$426.8 \div 10 = £42.68$ p/month ✓

✓

Dexter should choose option B ✓

Each month he will pay £ 42.68

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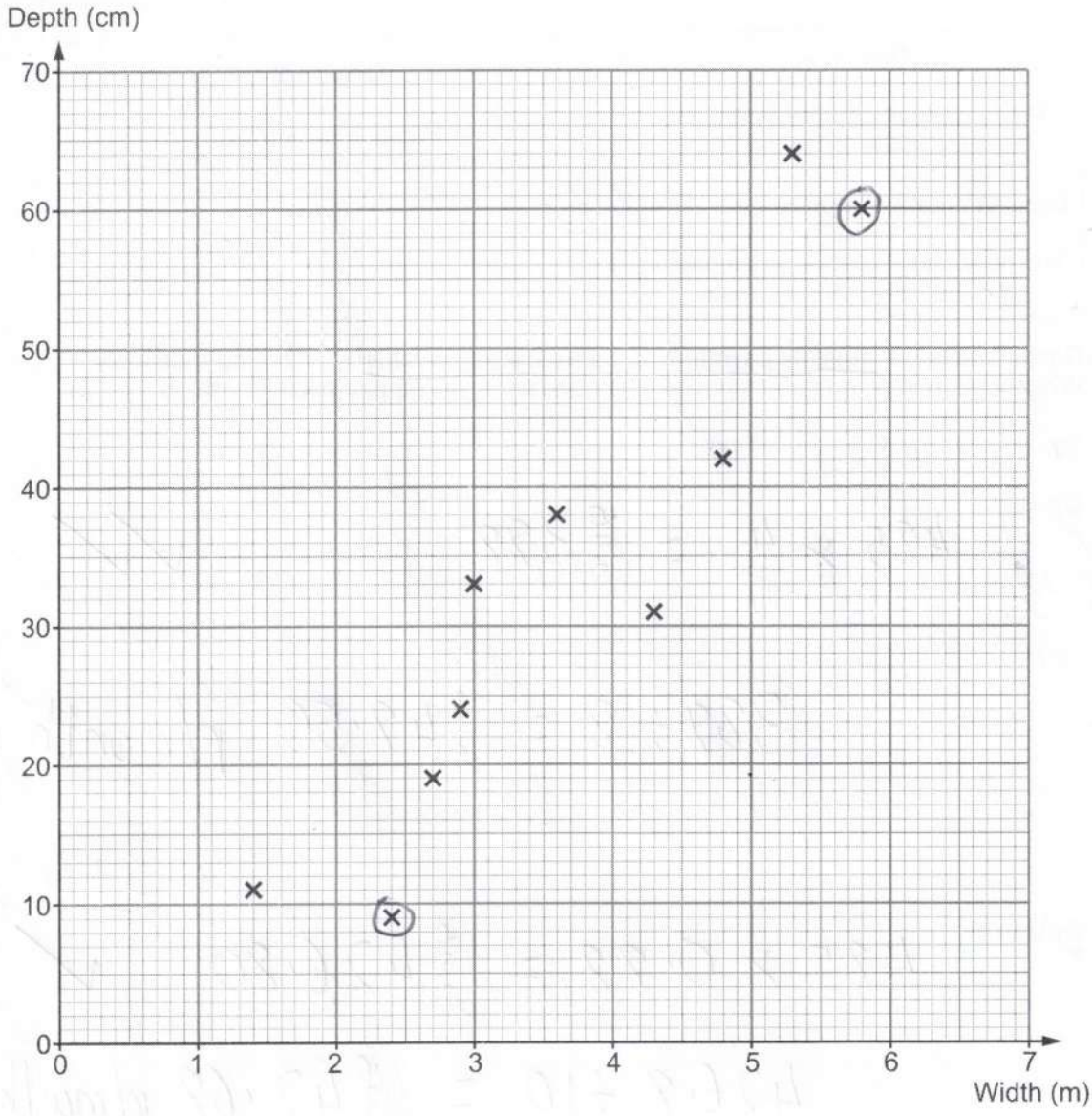
16. Peng is studying a river for his Geography coursework.
He is investigating whether there is a relationship between the width (in metres) and depth (in centimetres) of the river.

The scatter diagram below shows the information he has collected.



(a) Use information from the scatter diagram to complete the following sentences:

(i) Where the river is at its least depth, the width of the river is 2·4 m. [1]

(ii) Where the river is at its widest point, the depth of the river is 60 cm. [1]

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(b) What conclusion can Peng make about the relationship between the width and depth of the river? [1]

The wider the river the greater the depth ✓

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17. A right-angled triangle and a square are shown below.

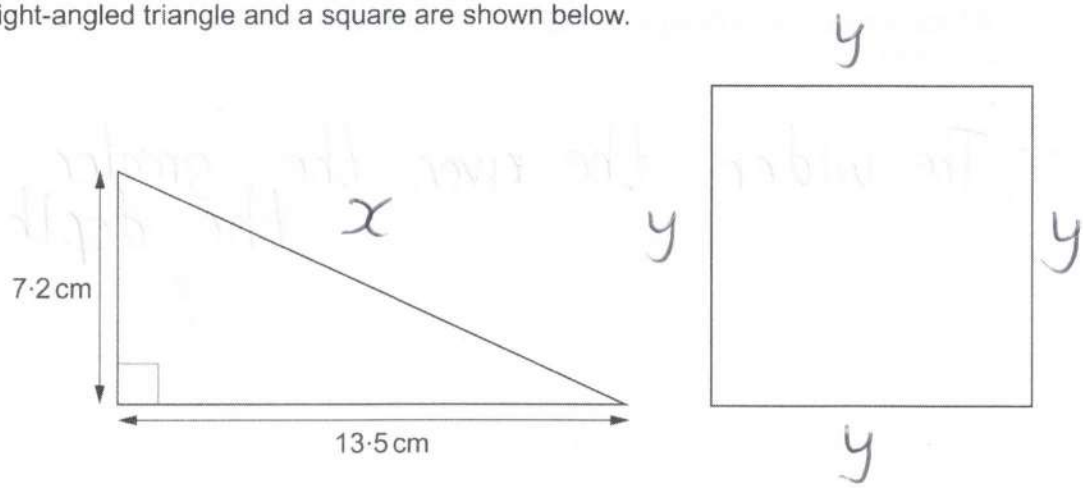


Diagram not drawn to scale

The perimeter of the triangle is equal to the perimeter of the square.

Calculate the area of the square.
You must show all your working. [6]

$x = \sqrt{7.2^2 + 13.5^2} = 15.3$ ✓ ✓ ✓

Triangle Perimeter
$= 7.2 + 13.5 + 15.3$
$= 36$ ✓

Square: $4y = 36$
$y = 9$ ✓

9×9
81 ✓

Area of square = ... cm^2

Examiner only

18. Elijah has a large cylinder of wax.
It has a radius of 7 cm and a height of 21 cm.

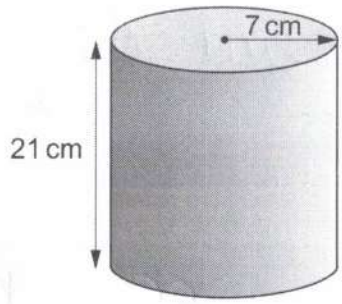


Diagram not drawn to scale

He melts down the large cylinder of wax to make small wax cylinders each with a volume of 102 cm^3.

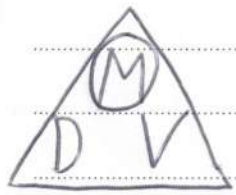
How many complete small wax cylinders can Elijah make? [3]

✓ $\frac{\pi \times 7^2 \times 21}{102} = 31.69$

✓

$= 31$ complete ✓

19. The density of copper is 8·96 g / cm^3.
A solid copper statue has a volume of 1540 cm^3.
Calculate its mass in kilograms.
Give your answer correct to two significant figures. [4]



$M = \frac{8.96 \times 1540}{1000}$ g

$= 13.7984$

Mass = 14 kg

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20. (a) Simplify $4x^3y^5 \times 7x^2y^1$. [2]

$28x^5y^6$ ✓✓

(b) (i) Solve $n+11<4n-5$. [3]

$16 < 3n$ ✓✓

$\frac{16}{3} < n$ or $n > \frac{16}{3}$ ✓

(ii) n is an integer.
What is the least possible value of n? [1]

$\frac{16}{3} = 5\frac{1}{3}$ so $n = 6$ ✓

(c) Make x the subject of the formula. [1]

$\frac{a}{x} = b$ $x = \frac{a}{b}$ ✓

21. 1 micrometre = 1×10^{-4} centimetres. ÷100
Which of the answers below represents 2·4 micrometres in **metres**?
Circle your answer. [1]

$2{\cdot}4 \times 10^{-4}$ (circled) $2{\cdot}4 \times 10^{-6}$ ✓ $2{\cdot}4 \times 10^{2}$ $2{\cdot}4 \times 10^{-2}$ $2{\cdot}4 \times 10^{-5}$

$2.4 \times 10^{-4} \div 100$

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22. A new supermarket is about to open in a town with 8000 houses.
For the first four weeks, £10 vouchers will be sent out to encourage people to visit the supermarket.

→ 70% don't

At the start of the first week, 30% of the houses in the town will each be sent a voucher.
At the start of each of the next three weeks, a voucher will be sent to 30% of the houses that have **not yet received** a voucher.
The vouchers need to be used in the supermarket by the end of the four weeks.

(a) John, the supermarket manager, says

"By the end of the four weeks, 6079 of the vouchers will have been used."

Show that John could be correct. [4]

✓ ✓ ✓

$8000 \times 0.7^4 = 1920.8 = 1921$ not given

$8000 - 1921 = 6079$ ✓

(b) (i) State an assumption that John has made in part (a). [1]

Every home given a voucher used it

(ii) If John's assumption was not correct, what effect would this have on the number of vouchers used by the end of the four weeks? [1]

The 6079 would be reduced

Examiner only

23. (a) Tiana and Kamal work at a bank.
Their hourly pay rates are different.

On Thursday, Tiana worked for six hours and Kamal worked for seven hours.
Their combined income on Thursday was £185.75.

On Friday, Tiana worked for five hours and Kamal worked for four hours.
Their combined income on Friday was £130.50.

Use an algebraic method (not trial and improvement) to calculate Tiana and Kamal's hourly pay rates.
You must show all your working. [5]

$6x + 7y = 185.75$ (×5)
$5x + 4y = 130.50$ (×6) ✓

$30x + 35y = 928.75$
$-\ 30x + 24y = 783$ ✓
$11y = 145.75$
$y = 145.75 \div 11 = 13.25$

$6x + 7 \times 13.25 = 185.75$
$6x + 92.75 = 185.75$ ✓
$6x = 93$
$x = 93 \div 6 = 15.5$

Tiana's hourly pay rate is £15.50 ✓ Kamal's hourly pay rate is £13.25 ✓

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(b) Fran also works at the bank part-time.
She earns 35% less than the full-time salary at her pay rate.
Fran's annual part-time salary is £24 570.
What would Fran's annual salary be if she worked full time? [3]

$x \times 0{\cdot}65 = 24570$ ✓

$x = 24570 \div 0{\cdot}65$ ✓

$= £37800$ ✓

END OF PAPER