1. Enzo and Jane are taking a group of children to the beach for a day trip.
They go to a shop to buy some items for the trip.

| Bucket £2.35 | Beach ball £3.20 | Set of spades £4.10 | Toy duck 0·95p |

×15   ×17

(a) Complete Enzo's bill below. [4]

Enzo's Bill		
15	Buckets	£ 35·25
3	Sets of spades	£12.30
17	Toy ducks	£ 16·15
	Total	£ 63·70

÷ 4·10

(b) Enzo is given a 10% discount.
How much discount will he get? [1]

63·70 × 0·9 = 57·33

63·7
− 57·33
= £6·37

(c) Jane has £15 to spend.
The shop has a special offer on beach balls:

'Buy two get one free'

What is the maximum number of beach balls Jane can buy? [2]

③ £6·40   ⑥ £12·80   so 6

2. (a) Write the number 340 205 in words. [1]

Three hundred and 40 thousand, two hundred and five

(b) Shade $\frac{1}{3}$ of the following shape. [1]

$$\frac{1}{3} = \frac{6}{18}$$
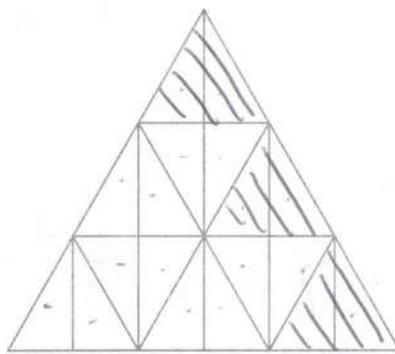
(c) What is the value of the 2 in the number 5·2614? [1]
Circle your answer.

$\frac{2}{1}$ $\qquad$ $\frac{2}{100}$ $\qquad$ $\boxed{\frac{2}{10}}$ $\qquad$ 2000 $\qquad$ 200

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

6 $\qquad$ −3 $\qquad$ −5 $\qquad$ 3·6 $\qquad$ 3·45

−5	−3	3·45	3·6	6
Smallest				Largest

(C300U20-1)

(e) Here are four cards with numbers on them.

| 4 | 3 | 7 | 5 |

(i) Write down the largest four-digit number that can be made by rearranging the cards. [1]

7 5 4 3

(ii) Write down the smallest **even** four-digit number that can be made by rearranging the cards. [1]

3 5 7 4

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(C300U20-1)

Turn over.

3. The scales below are used to measure the mass of some fruit in grams.

   (a) What is the total mass of the fruit on each of the scales? [1]
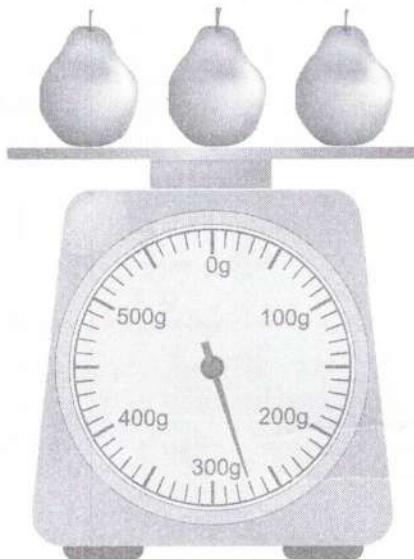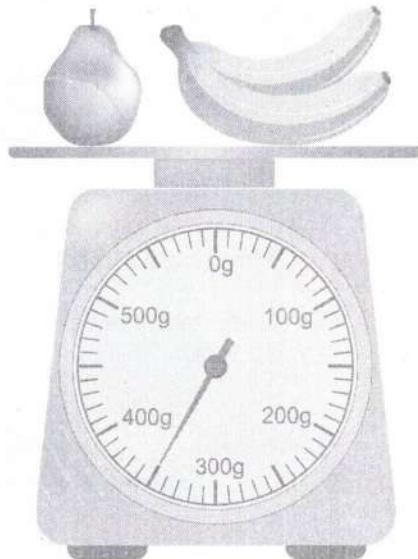
__270__ grams   __350__ grams

   (b) Calculate the mass of each pear and the mass of each banana.

   Assume that:

   • each pear has the same mass
   • each banana has the same mass. [3]

   $270 \div 3$ $\dfrac{350 - 90}{2}$

   Pear __90__ grams   Banana __130__ grams

(C300U20-1)

4. (a) (i) One hundred tickets are sold in a raffle.
A ticket is to be selected at random and the person with that ticket wins the prize.
Sandra buys one of the tickets.

Circle the expression that describes the chance that Sandra wins the prize in the raffle. [1]

impossible   (unlikely)   an even chance   likely   certain

(ii) Henry has six pairs of shoes in his cupboard.
He picks one shoe out at random.

Circle the expression that describes the chance that Henry picks out a shoe for his left foot. [1]

impossible   unlikely   (an even chance)   likely   certain

(b) Zac has a bag containing 12 marbles.
1 marble is green, 3 are red and the rest are blue.
Zac chooses one marble at random from the bag.

On the probability scale shown below, label the points **A**, **B** and **C** where:
·   **A** is the probability that Zac chooses a red marble
·   **B** is the probability that Zac chooses a yellow marble
·   **C** is the probability that Zac chooses a marble that is not green. [3]

B   A   C

0   1

G   R   B   Y
1   3   8   0

C = NG   A   B

© WJEC CBAC Ltd.   (C300U20-1)   **Turn over.**
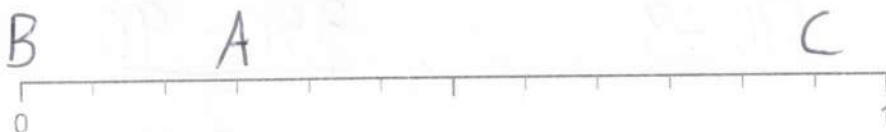
5. Nine shapes are shown below.

Shape A	Shape B	Shape C

Shape D	Shape E	Shape F

Shape G	Shape H	Shape I
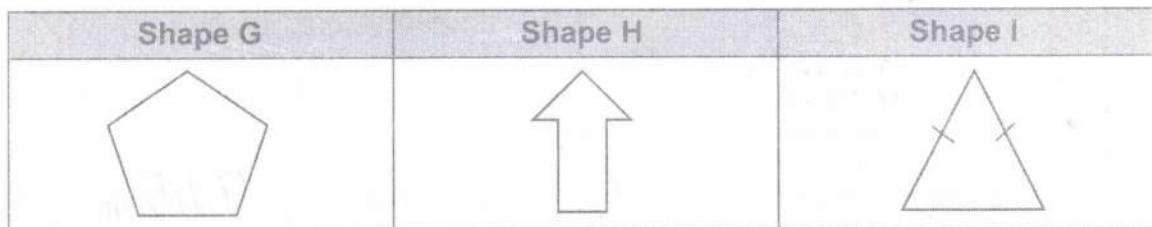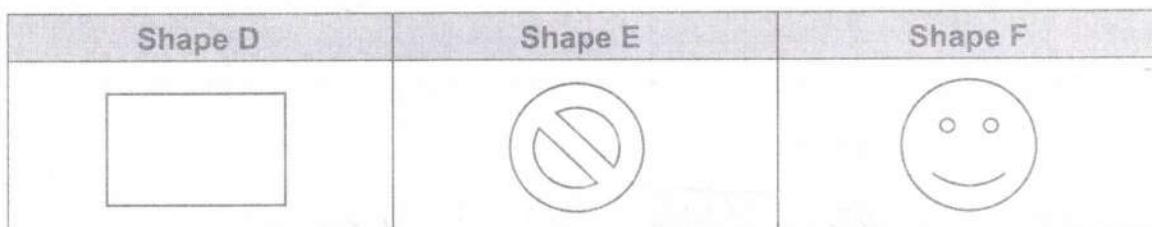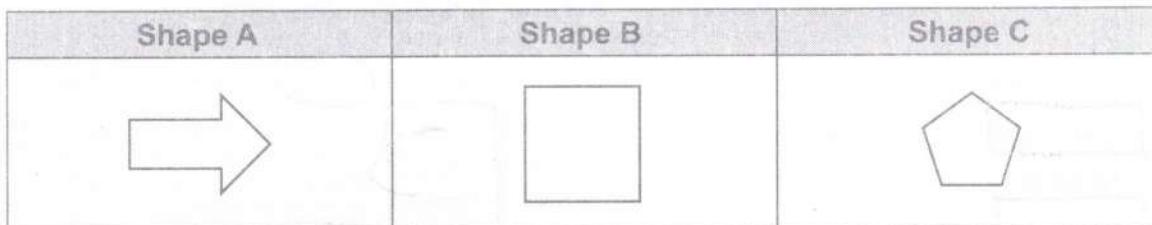
Complete the following sentences.   [4]

Shapes _____D_____ and _____E_____ have only two lines of symmetry.

Shape _____B_____ has rotational symmetry of order 4.

Shapes _____A_____ and _____H_____ are congruent.

Shapes _____C_____ and _____G_____ are similar but not congruent.

....

....

....

(C300U20-1)

6. The table below shows part of a train timetable between Portsmouth Harbour and London Waterloo.

Train Times: Portsmouth Harbour to London Waterloo

Portsmouth Harbour	06:15	07:14	07:45	08:15	08:45	09:15	09:45
Petersfield	06:48	07:45	08:17	08:47	09:17	09:47	10:17
Haslemere	07:02	07:59	08:31	09:01	09:31	10:00	10:31
Guildford	07:16	08:17	08:49	09:18	09:48	10:18	10:48
London Waterloo	07:53	08:56	09:30	09:55	10:29	10:52	11:24

(a) Elise catches the 08:45 train from Portsmouth Harbour to London Waterloo.

How long should her train journey take? [2]

15m + 60m + 29m = 104 mins

(b) Paul lives in Petersfield and works in Guildford.
He starts work at 10 a.m.
It takes him 15 minutes to walk from the train station to work.   9.45am
Paul needs to arrive at work on time.

What is the time of the latest train from Petersfield he can take? [2]

08:47

(C300U20-1)

Turn over.

7. Georgia is going on holiday to France.
    She takes one large suitcase and one piece of hand luggage.

    The graph below can be used to convert between kilograms and pounds.

Pounds (lb)
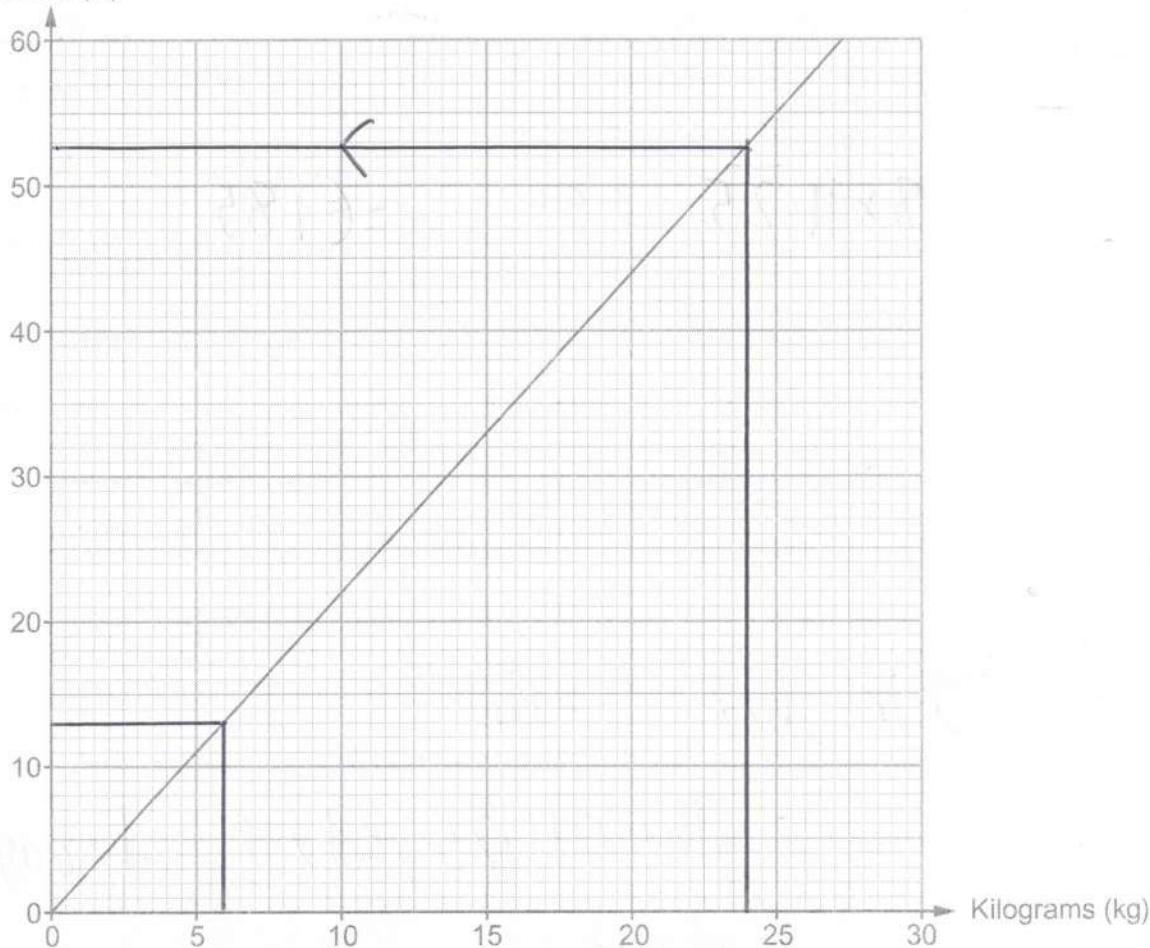
(a) (i) Georgia's suitcase has a mass of 24 kg.
          What is the mass of the suitcase in pounds?   [1]

          [ms: 52.66 → 53]   52.9

     (ii) Her hand luggage has a mass of 13 pounds.
           What is the mass of her hand luggage in kilograms?   [1]

           [ms: 5.7 → 6]   6

(b)   A car hire company in France uses the following formula to calculate costs in euros (€).

> Car hire cost = €11.25 × number of days car hire + insurance

(i)   Georgia decides to hire a car for 8 days.
Insurance will cost her €95.

Calculate the cost of Georgia's car hire.   [2]

$$8 \times 11.25 + 95 \qquad = €185$$

(ii)   Meena is also hiring a car from the same company.
She has €270 to spend on car hire.
Insurance will cost her €126.
She wants to hire the car for as many days as possible.

For how many whole days can Meena afford to hire the car?   [3]

$$270 - 126 = 144$$

$$144 \div 11.25 = 12.8 = 12\,days$$

(C300U20-1)   **Turn over.**

8. Malik is planning a birthday party for ⟨25⟩ children.
He can choose either a swimming party or an adventure centre party.

Swimming Party

£320 for 20 children.
£7.25 for each additional child.
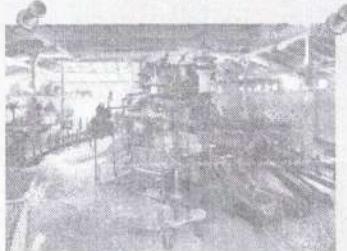
Adventure Centre Party

£13.60 per child.
15% off the total cost for
groups of more than 20 children.
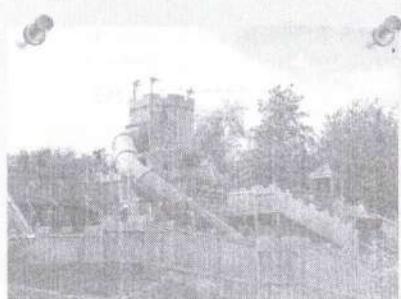
Special Offer:
$\frac{1}{3}$ off the total cost of the party.

Malik works out the total cost for each party.
He chooses the cheaper of the parties.

Which party does Malik choose?

Swimming Party ☑   Adventure Centre Party ☐

You must show all your working.   [7]

Swimming Party

$$320 + 5 \times 7.25 = 356.25$$

$$356.25 \times \frac{2}{3} = £237.50$$

Adventure Centre Party

$$13.6 \times 25 \times 0.85$$

$$= £289$$

9. Rochelle is training for a marathon.
For each of the last five weeks she has recorded how many miles she has run.

- Rochelle runs a whole number of miles each week.
- Her median is 23 miles.
- Her mode is 29 miles.
- Her range is 8 miles.

How many miles in total has Rochelle run in the last five weeks?
You may use the boxes below to help you.

[5]

| 21 | 22 | 23 | 29 | 29 |

124

Total number of miles Rochelle has run 124miles

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Turn over.

10. Two different companies use pie charts to show the proportion of male and female employees.
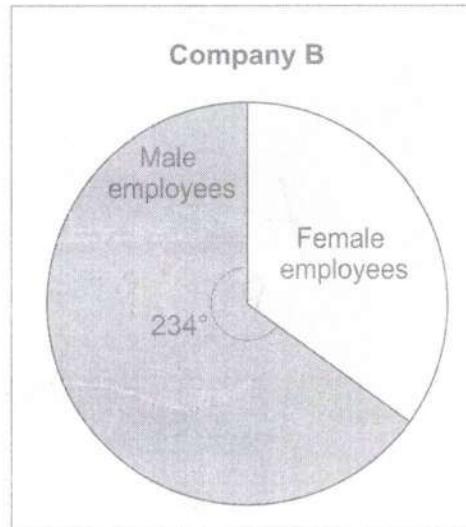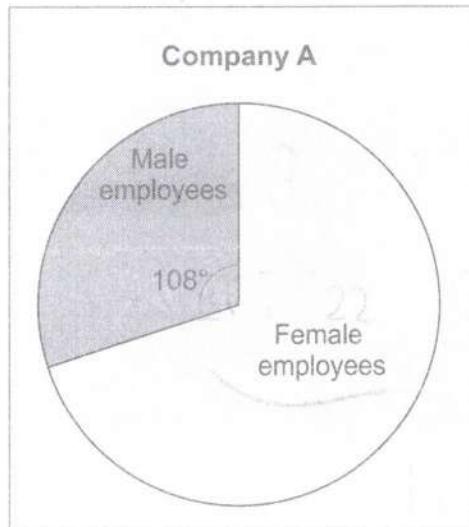
Company A

Company B

(a) Jamie says,

"Company A has more female employees than Company B."

Give a reason why he may be incorrect. [1]

B could have more employees

(b) Calculate the difference between the **percentage** of male employees in Company A and the **percentage** of male employees in Company B. [3]

(A) $\frac{108}{360} \times 100 = 30\%$

(B) $\frac{234}{360} \times 100 = 65\%$ } 35% difference

(C300U20-1)

11. A shop sells the same breakfast cereal in two different-sized boxes.
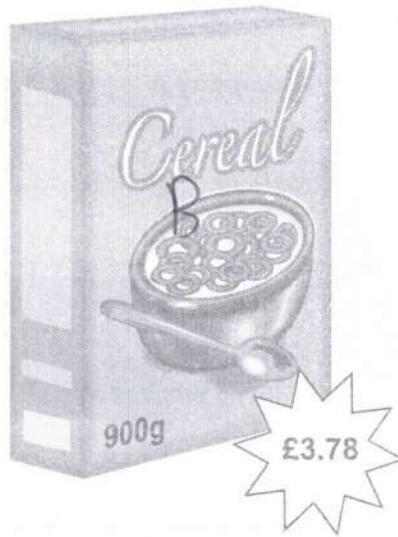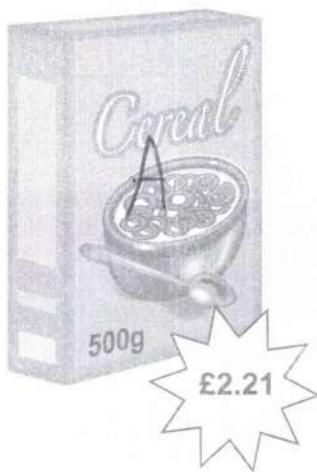
500g £2.21

900g £3.78

Which box is the better value for money?

500 g ☐   900 g ☑

You must show all your working. [2]

Ⓐ 100g = 2·21 ÷ 5 = £0·442

Ⓑ 100g = 3·78 ÷ 9 = £0·42

(C300U20-1)

Turn over.

12. (a) Simplify $10a \div 2$. [1]

$5a$

(b) Solve $4x - 5 = 2$. [2]

$4x = 7$

$x = \dfrac{7}{4} = 1\dfrac{3}{4} = 1.75$

(c) Expand $7(g - 6)$. [1]

$= 7g - 42$

(d) Factorise $6x + 4$. [1]

$2(3x + 2)$

(e) The shape below is a square.

$8x$

Diagram not drawn to scale

(i) Find an expression for the perimeter of the square. Simplify your answer. [2]

$8x \times 4 = 32x$

(ii) Find an expression for the area of the square. Simplify your answer. [2]

$8x \times 8x = 64x^2$.

(C300U20-1)

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$8x \times 8x = 64x^2$

(C300U20-1)

14. Lynda cycles 31·5 km from home to work each day.

(a) One day, her journey to work takes her 1 hour and 45 minutes.

$= 1\frac{3}{4}$

$= 1·75$

Calculate her average speed in km/h. [2]

$\dfrac{D}{S \ T}$

$$S = 31·5 \div 1·75$$

$$= \underline{18 \ km/h}$$

(b) Lynda cycles home following the same route.
She leaves work at 4 p.m.
Her average speed on this journey is 15 km/h.

At what time does Lynda arrive home?
You must show all your working. [4]

$\dfrac{D}{S \ T}$

$$31 \div 15 = 2·06 \ hr$$
$$= 2hr \ 6min$$

$$\underline{6·06 \ pm}$$

(C300U20-1)

15.

152°

3*x*°

Diagram not drawn to scale

2*y*°

126°
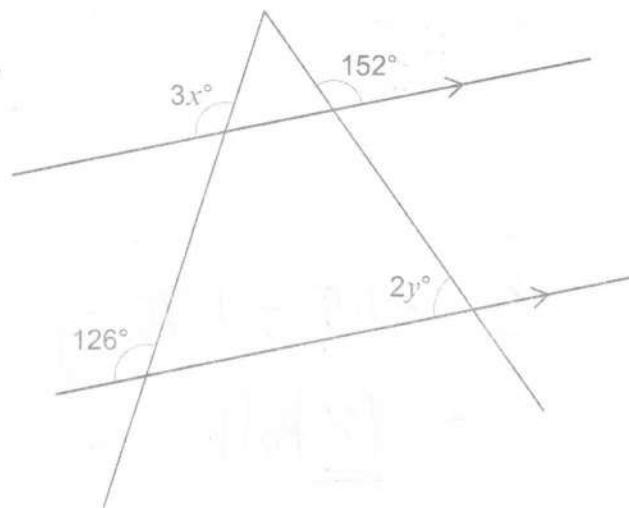
Find the value of *x* and the value of *y*. [3]

$$3x = 126$$

$$x = 126 \div 3$$

$$2y = 180 - 152$$

$$2y = 28$$

$$y = 28 \div 2$$

$$42$$

$$14$$

x = 42   *y* = 14

16. Calculate the value of $\dfrac{\sqrt{1456}}{(1\cdot3^3 - 0\cdot7)}$ = 25·489...

Give your answer correct to 1 decimal place. [2]

= 25·5

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17. Tobias has a tank in the shape of a cuboid.
It has length 40 cm, width 25 cm and depth 32 cm.
He uses a jug with a capacity of 2 litres to fill the tank.
The tank and jug are shown below.

Diagram not drawn to scale

$$32 \times 40 \times 25$$
$$= 32000 cm^2$$
$$= 32000 ml$$

32 cm

40 cm

25 cm
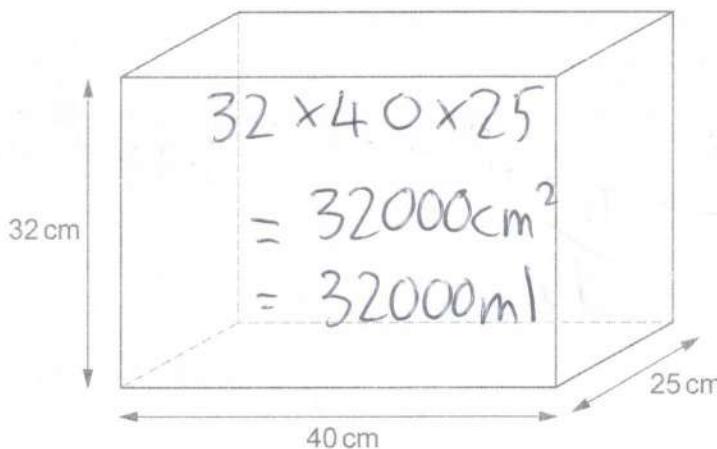
Jug capacity
2 litres

Tobias fills the jug to the top with water and pours it into the tank.
He repeats the process until the tank is full.

How many times does Tobias fill the jug? [5]

$$= 32 \text{ litres}$$

$$32 \div 2$$

Tobias fills the jug ___16___ times.

(C300U20-1)

18. Nathan and Lucy make and sell wooden items for gardens.

(a) Nathan makes and sells benches, tables and tool sheds.
Last year, the profit he made from selling these items was in the following ratio.

<div align="center">

benches : tables : tool sheds
2   :   3   :   7

</div>

(i) What fraction of his profit did Nathan make from selling benches and tables? [1]

$$2+3$$

$$\frac{5}{12}$$

(ii) His total profit was £18072.

How much profit did Nathan make from the sale of tool sheds? [2]

$$\frac{7}{12} \times 18072 = £10542$$

(b) Lucy makes and sells planters.
Each planter costs Lucy £32 to make.
Each one that she sells makes a **profit** of £80.
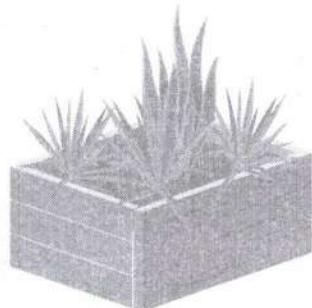
What is Lucy's profit from the sale of one planter
as a percentage of the cost to make the planter? [2]

$$\frac{80}{32} \times 100 = 250\%$$

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19. The table gives a summary of the masses, m grams, of 30 buzzards.

650 750 850

Mass, m (grams)	$600 \leqslant m < 700$	$700 \leqslant m < 800$	$800 \leqslant m < 900$	$900 \leqslant m < 1000$
Frequency	✗ 8	✗ 7	✗ 4	✗ 11

950

(a) Moeen uses the midpoint of each group to calculate an estimate of the mean mass of these buzzards.
He does this correctly.

Calculate Moeen's answer. [3]

$$5200 + 5250 + 3400 + 10450$$

$$= 24300$$

$$24300 \div 30 = \underline{810}g$$

(b) Deeta decides to estimate the mean mass of these buzzards.
She uses the values 600, 700, 800 and 900 rather than the midpoints.

Explain why her method is unlikely to give a good estimate of the mean mass. [1]

This will definitely give an underestimate

(C300U20-1)

20. Debbie collects data about a group of 20 people.

Her data is:
- the total number of years for which they have owned a pet
- the number of visits they have each made to their doctor in the last year.

The scatter graph shows her results and her attempt to draw a line of best fit for the data.

Number of visits to the doctor

Total number of years of pet ownership

(a) Make a criticism of Debbie's line of best fit. [1]

There should be a balance of data above/below her line

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Number of visits to the doctor

Total number of years of pet ownership

(a) Make a criticism of Debbie's line of best fit. [1]

There should be a balance of data above/below her line

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(b)   Debbie says,

Because there is a **negative correlation**, owning a pet for
longer **causes** people to need to visit the doctor less often.

Is Debbie correct?

Yes ☐   No ✓

Explain how you decide.   [1]

Correlation doesn't imply causation

(C300U20-1)

Turn over.

21. Janet invests £5000 in a savings account for 9 years.
She makes no further payments into or out of her account in this time.

For the first 5 years, her investment earns 2% compound interest per year.
After this, the interest rate decreases to 1·3% compound interest per year.

How much is Janet's investment worth at the end of the 9 years? [4]

$$5000 \times 1.02^5 \times 1.013^4$$

$$= 5813 \cdot 111...$$

$$= £5813 \cdot 11$$

22. (a) Circle the correct conversion of 7 m³ to cm³. [1]

0·000 07   0·07   700   70 000   (7 000 000)

×100   ×100
×100

(b) The diagram shows a shape made from a trapezium and a circle.


79 cm

30 cm

62 cm
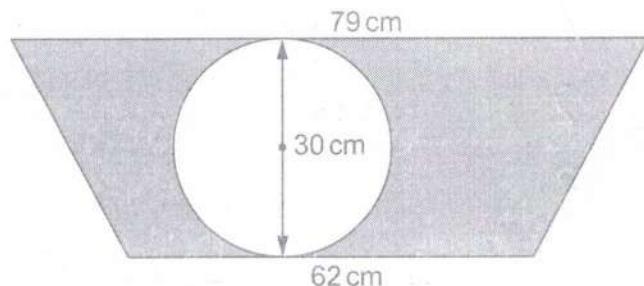
Diagram not drawn to scale

The parallel sides of the trapezium are tangents to the circle.
The diameter of the circle is 30 cm.

The ratio of the white area to the **shaded** area is as follows.

$$\text{white area} : \text{shaded area}$$
$$1 \quad : \quad k$$

Find the value of k.
Show all your working and give your answer correct to 1 significant figure. [6]

$$\text{Whole} = \frac{1}{2}(62+79) \times 30 = 2115$$

$$\text{Circle} = \pi \times 15^2 = 225\pi$$

$$\text{Shaded} = 2115 - 225\pi = 1408.1$$

White : Shaded

$$225\pi : 1408.1$$

$\div 225\pi$

$$1 : 1.9921...$$
$$1 : 2$$

(C300U20-1) **Turn over.**

23. (a) Solve $5x + 4 = 2x + 6$. [2]

$$3x = 2$$

$$x = \frac{2}{3}$$

(b) Solve $4x - 3 > 17$. [2]

$$4x > 20$$

$$x > 5$$

(c) Solve the following simultaneous equations. Use an algebraic (not graphical) method.

$$5x - 2y = 16 \quad \text{①}$$
$$x - y = 5 \quad \text{②}$$

You must show all your working. [3]

$$\text{①} \quad 5x - 2y = 16 \quad -$$
$$\text{②} \times \text{②} \quad 2x - 2y = 10$$
$$\overline{\quad 3x \qquad = 6 \quad} \qquad \text{so} \quad \underline{x = 2}$$

$$\text{②} \quad 2 - y = 5 \qquad \text{so} \qquad \underline{y = -3}$$

(C300U20-1)

24.
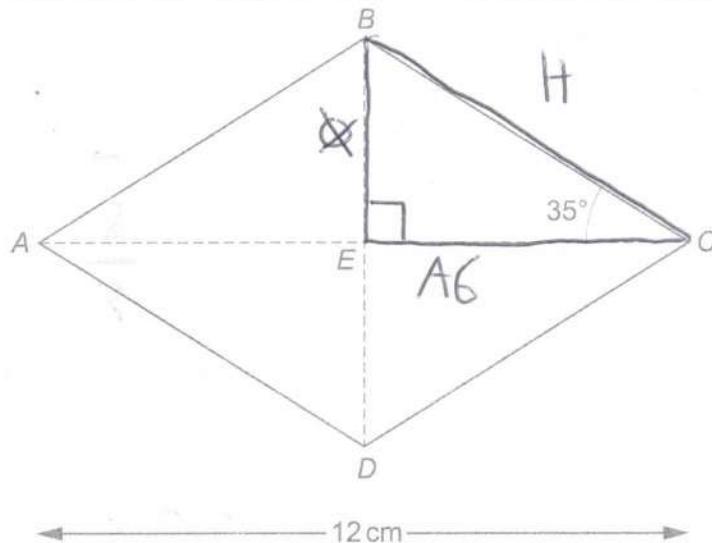
Diagram not drawn to scale

The diagram shows a rhombus, *ABCD*.
AC and *BD* intersect at *E*.
The length of *AC* is 12 cm.
$B\hat{C}E$ is 35°.

Find the perimeter of *ABCD*. [6]

$$BC = \frac{6}{\cos 35}$$

$$= 7.324...$$

$$\times 4$$

$$= 29.298...$$

Perimeter of *ABCD* = 29.3 cm

END OF PAPER

Turn over.