Answer **all** questions in the spaces provided.

1 (a)   A linear sequence starts

$$4 \overset{}{+3} \; 7 \overset{}{+3} \; 10 \overset{}{+3} \; 13 \overset{}{+3}$$

Write down the next number in this sequence.

[1 mark]

Answer   16   ✓

1 (b)   A different linear sequence starts

$$19 \overset{}{-5} \; 14 \overset{}{-5} \; 9 \overset{}{-5} \; 4 \overset{}{-5}$$

Write down the next number in this sequence.

[1 mark]

Answer   −1   ✓

1 (c)   Here is another sequence.

$$3 \overset{}{\times 2} \; 6 \overset{}{\times 2} \; 12 \overset{}{\times 2} \; 24$$

Write down the term-to-term rule for this sequence.

[1 mark]

Answer   48

2 Here is a price list.

Soap	£2.00
Candle	£4.55
Lip scrub	£1.75
Body cream	£3.80

× 3

2 (a) Work out the cost of three candles.

[1 mark]

Answer £ 13·65 ✓

2 (b) Sal has £7.50

He wants to buy one soap and one body cream.

Does he have enough money to also buy one lip scrub?
Tick a box.

Yes [ ] No [✓]

Show working to support your answer.

[2 marks]

2 + 1·75 + 3·80 = 7·55 ✓✓

6

3 (a)   Solve $5x = 30$

[1 mark]

$$x = 30 \div 5$$

$x =$ _____ 6 ✓

3 (b)   Solve $-2 + y = 10$

[1 mark]

$$y = 10 + 2$$

$y =$ _____ 12 ✓

3 (c)   Simplify fully $\dfrac{20x}{4x}$

[2 marks]

$$20 \div 4 = 5$$

Answer _____ 5 ✓✓

$(\checkmark = partial)$

4   Points *A*, *B* and *C* are plotted on a grid.
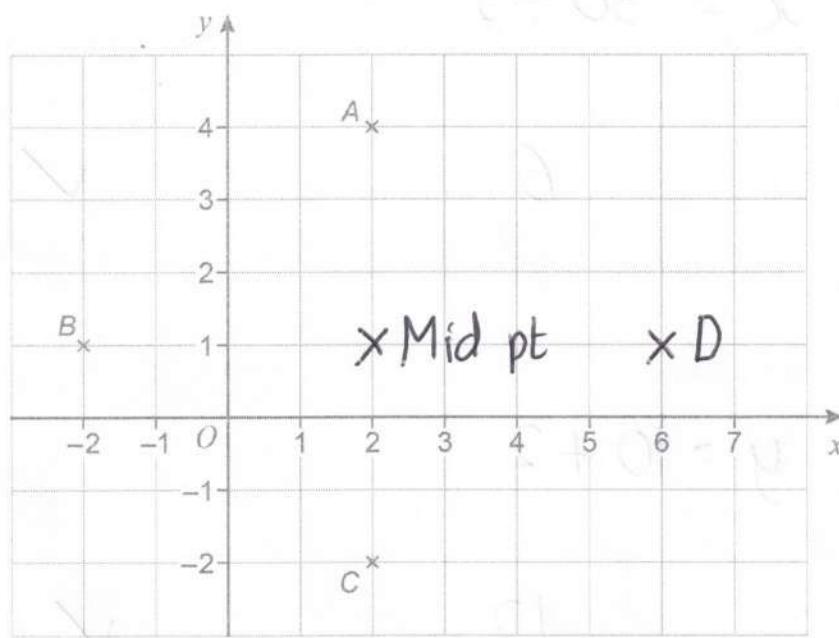
4 (a)   Write down the coordinates of *C*.

[1 mark]

Answer (__2__ , __-2__) ✓

4 (b)   Write down the coordinates of the midpoint of *AC*.

[1 mark]

Answer (__2__ , __1__) ✓

4 (c)   Plot point *D* on the grid so that *ABCD* is a rhombus.

✓ [1 mark]

7

Turn over ▶

5 Here are five numbers.

14.2   15.1   16.5   16.7   18.0

5 (a) Work out the range.

[1 mark]

$18 - 14 \cdot 2$

Answer $3 \cdot 8$

5 (b) Work out the mean.

[2 marks]

$14 \cdot 2 + 15 \cdot 1 + 16 \cdot 5 + 16 \cdot 7 + 18$ ✓

$= 80 \cdot 5$

$80 \cdot 5 \div 5$

Answer $16 \cdot 1$ ✓

6 (a) *AB* is a straight line.

Not drawn accurately

145° x

A   B
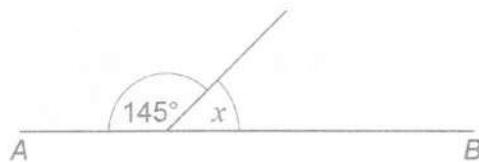
Work out the size of angle x.

[1 mark]

$$180 - 145$$

$x =$ 35   °

6 (b)
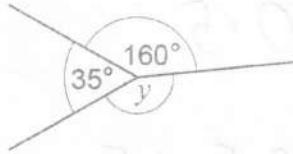
Not drawn accurately

160°
35° y

Work out the size of angle y.

[2 marks]

$$360 - 160 - 35$$ ✓

$y =$ 165   ° ✓

Turn over ▶

6 (c)   Three straight lines intersect as shown.

Not drawn
accurately
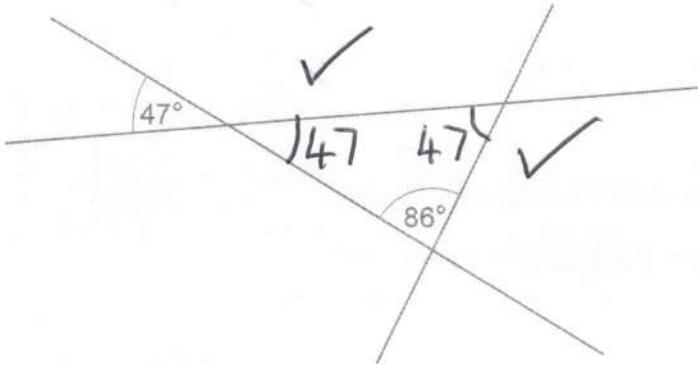
What type of triangle is made?

You **must** show your working.

[3 marks]

$180 - 47 - 86 = 47$

2 angles the same

Answer   isosceles ✓

7   The table shows information about the packs of juice a family has.

Number of packs	Number of cartons in a pack	
5	✗ 8	= 40
16	✗ 3	= 48

= 88 ✓

The family drinks 4 cartons of juice each day.

In total, how many days will their packs last?

[3 marks]

$$88 \div 4 \quad ✓$$

Answer   22   days ✓

Turn over for the next question

6

Turn over ▶

8   100 people voted in an election for Jo, Kim or Liam.

The pictogram shows the results for Jo and Kim.

Key: ◯ represents 8 people

Jo	◯ ◯ ◯ ◯ ◯ ◯
Kim	◯ ◯ ◯ ◯ ◖
Liam	O O

✓

Complete the pictogram.

[3 marks]

$J = 6 \times 8 = 48$

$K = 4 \times 8 \quad +4 \quad = 36$ ✓

$L = 100 - 48 - 36 = 16$ ✓

9 Callum is making pizza.

He can choose three **different** toppings from

- ham (H)
- sweetcorn (S)
- onion (O)
- mushrooms (M).

List **all** the possible options for the three toppings.

The first one has been done for you.

[2 marks]

H S O
H S M
H O M
S O M

✓✓

[✓ any 1]

Turn over for the next question

5

Turn over ▶

1 1

10 (a) Write $\frac{3}{8}$ as a percentage.

[1 mark]

$\times 100$

37·5

Answer _____ % ✓

10 (b) Work out $\frac{15}{32}$ as a decimal.

Give your answer to 2 decimal places.

[2 marks]

$15 \div 32 = \underline{0·46875}$ ✓

Answer _____ 0·47 _____ ✓

11 Tick **one** box for each statement.

[3 marks]

	True	May be true	Not true
If a number is > 0 the number is positive	✓			✓
If a number is $\leqslant 3$ the number is 1		✓		✓
If a number is $\geqslant 5$ the **smallest** possible value of the number is 5	✓			✓

12 (a) Work out the value of $x^2 + 7x$ when $x = -4$

[2 marks]

$$= (-4)^2 + 7(-4)$$

$$= 16 - 28 \quad \checkmark \text{either}$$

Answer $\quad -12 \quad \checkmark$

12 (b) Rearrange $y = w - 1$ to make w the subject.

[1 mark]

$w = \quad y + 1 \quad \checkmark$

12 (c) Simplify fully $4(a + 2) + a$

[2 marks]

$$\underline{4a + 8} + a \quad \checkmark$$

Answer $\quad 5a + 8 \quad \checkmark$

11

Turn over ▶

13   The time Shaz takes to run a race is 1 minute 28 seconds **less** than 2 hours.

Work out her time in hours, minutes and seconds.

[2 marks]

2hrs - 1min = 1hr 59mins

59mins = 58mins 60 secs

Answer   1   hour   58   minutes   32   seconds   ✓✓

$\left(\begin{array}{c} ✓ \text{ any 2} \\ \text{values} \end{array} \right)$

14 Some people were asked to choose their favourite fruit.

The pie chart shows information about the results.

Not drawn accurately

Pear

Banana → 90°

48°

78°

Apple

Other
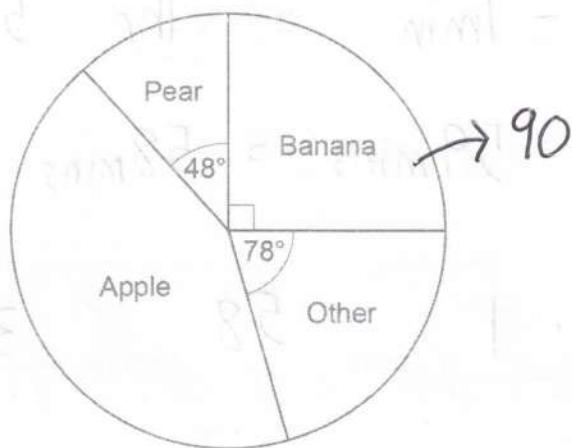
120 people chose Banana.

How many people chose Apple?

[4 marks]

Apple = 360 − 90 − 78 − 48

= 144° ✓
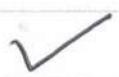
Total = 120 × 4 = 480 ✓

$\dfrac{144}{360}$ × 480 ✓

Answer _____ 192 ✓

6

Turn over ▶

IB/M/Nov24/8300/2F

15 The graph represents the volume of water in a bath.

The bath is full after 10 minutes.
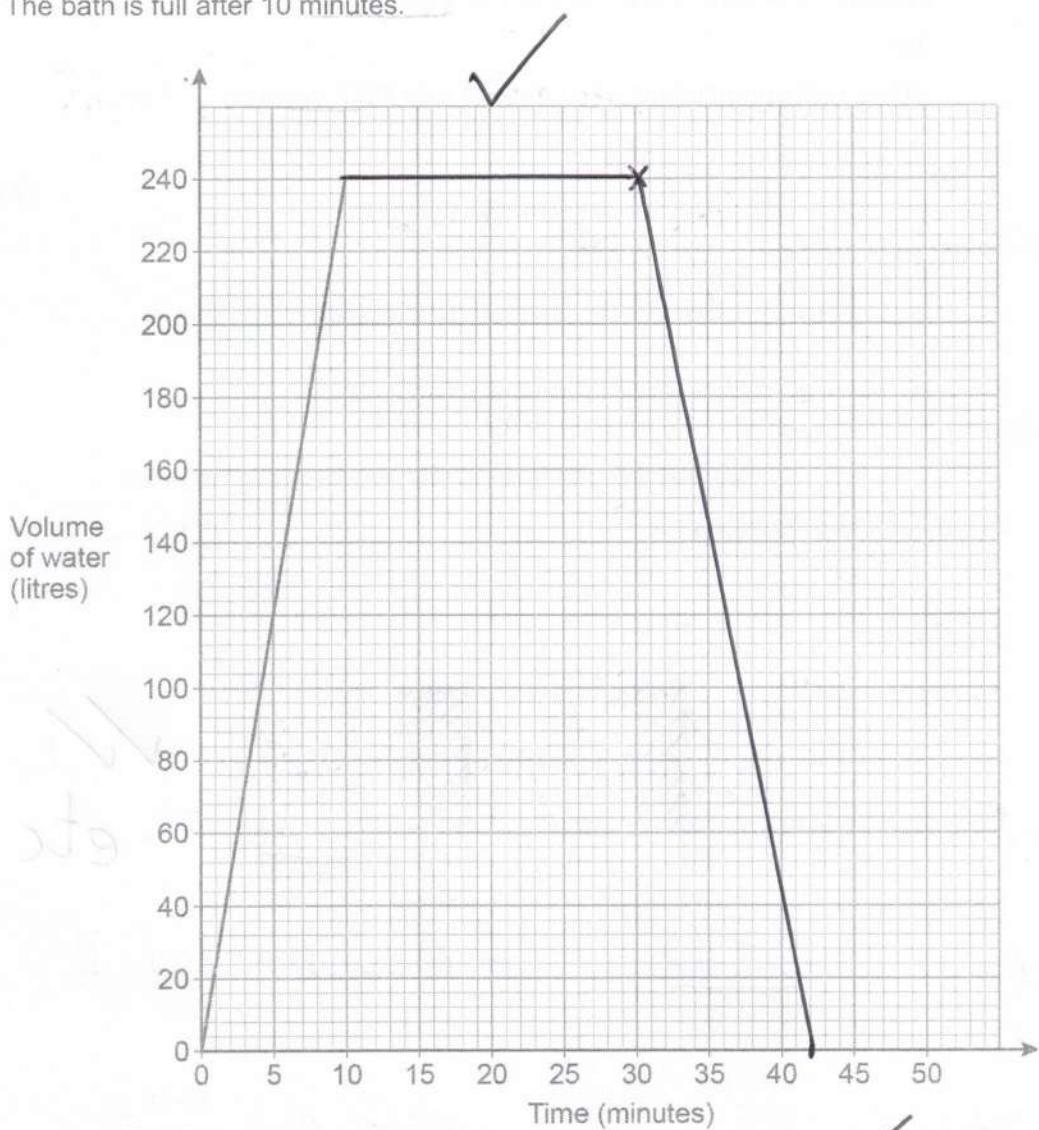
15 (a) Work out the rate at which the bath is filled.

State the units of your answer.

[2 marks]

$240 \div 10 = 24$ litres/min

Answer ___24 l/min___

15 (b) After the bath is full,

the volume of water stays constant for 20 minutes

then

all the water empties out at a constant rate in 12 minutes.

Show this information on the graph.

[2 marks]

16 In the grid below, shade **one quarter** of the squares

so that the grid has exactly **two** lines of symmetry.

Shade complete squares only.

[2 marks]

✓✓
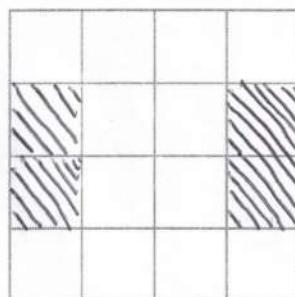
etc

Turn over for the next question

6

Turn over ▶

17 A map has a scale of 1 : 4000

On the map, the distance from a station to a museum is 7 cm

Is the **actual** distance from the station to the museum **more** than 300 m?

Tick a box.

Yes ☐   No ☑

Show working to support your answer.

[3 marks]

$7\text{cm} \times 4000 = 28000\text{cm}$ ✓

$28000 \div 100 = 280\text{m}$ ✓

$280 < 300$

and no ✓

18 X is inversely proportional to Y.

$X = \dfrac{1}{Y}$ so $Y = \dfrac{1}{X}$

Circle the correct statement.

[1 mark]

X is directly proportional to Y

$\boxed{X \text{ is directly proportional to } \dfrac{1}{Y}}$ ✓

X is directly proportional to $2Y$

X is directly proportional to $\sqrt{Y}$

19 Here is a right-angled triangle.
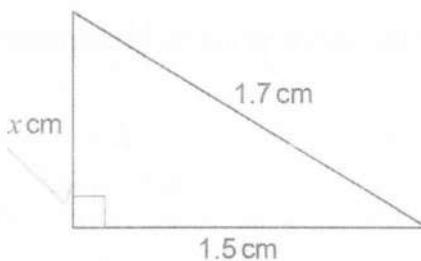
Not drawn accurately

Use Pythagoras' theorem to show that $x = 0.8$

[2 marks]

$$x = \sqrt{1.7^2 - 1.5^2}$$

$$x = \sqrt{0.64} = 0.8$$

Turn over for the next question

6

Turn over ▶

20 Beth and Lynn each spin the same biased coin a number of times.

The table shows information about the results.

	Beth	Lynn
Number of spins	125	80
Relative frequency of Heads	0.32	0.35

20 (a) How many **more** Heads did Beth spin than Lynn?

[2 marks]

$B = 125 \times 0.32 = 40$

$L = 80 \times 0.35 = 28$

✓ either

Answer 12 ✓

20 (b) Lynn says,

"My estimate of the probability of the coin landing on Heads must be the best, because 0.35 is greater than 0.32"

Is she correct?

Tick a box.

Yes ☐   No ✓

Give a reason for your answer.

[1 mark]

Lynn did fewer spins ✓

21   Some oil has

a mass of 537 g

a density of 895 000 g/m^3

1 m^3 = 1000 litres

Work out the volume of the oil.

Give your answer in litres.

[2 marks]

$$V = \frac{M}{D} = \frac{537}{895000 \div 1000}$$

$$= \frac{3}{5}$$

Answer _____ or _0.6_ _____ litres

Turn over for the next question

5

Turn over ▶

22   Use trigonometry to work out the value of x.

Not drawn accurately

H

21 cm

x

O

40°

A

S O H
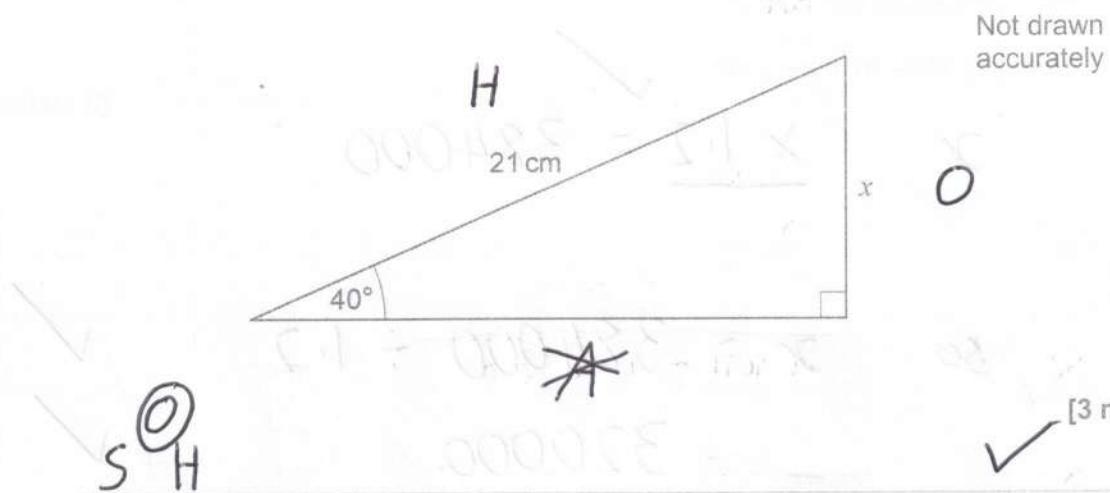
[3 marks] ✓

$$x = \sin 40 \times 21$$ ✓

$$= 13.4985...$$

Answer   13.5   cm ✓

23   The length of a wall is 9 metres to the nearest metre.

Complete the error interval for the length of the wall.

$\pm \frac{1}{2} m$

[2 marks]

Answer   8.5   m ⩽ length <   9.5   m

or 9.4$\dot{9}$

✓ ✓

24 384 000 electric cars were sold this year.

This is 20% **more** than last year.

How many were sold **last year**? ✓

[3 marks]

$$x \quad \underline{\times 1.2} = 384000$$

$$\text{so} \quad x = 384000 \div 1.2 \quad ✓$$

$$320000 \quad ✓$$

Answer 320000

25 Here are three terms.

$$xy \qquad x^2 \qquad 5y^2$$

Alec multiplies two of these terms.

Work out the **three** possible fully simplified answers.

[3 marks]

$$xy \times x^2$$

$$xy \times 5y^2$$

$$x^2 \times 5y^2$$

Answer $x^3 y$ ✓

Answer $5xy^3$ ✓

Answer $5x^2y^2$ ✓

11

Turn over ▶

26 Here is a rectangle.

All measurements are in centimetres.

Not drawn
accurately
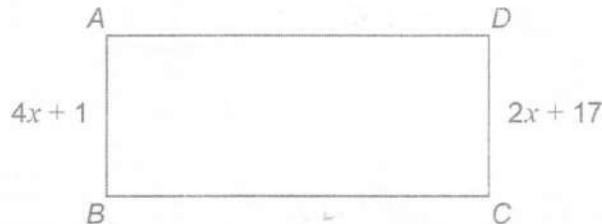
$AB : BC = 1 : 3$

Work out the value of the area.

[5 marks]

$$4x + 1 = 2x + 17$$
$$2x = 16$$
$$x = 8$$

$$AB = 4 \times 8 + 1$$
$$= 32 + 1 = 33$$

$$BC = 33 \times 3 = 99$$

$$Area = 99 \times 33$$

Answer _____ 3267 _____ cm²

END OF QUESTIONS

5