Answer ALL NINETEEN questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Sandeep sells 600 tickets for an event. ✓
He receives a total of £7200 from selling the tickets.

$\frac{1}{4}$ of the tickets sold are child tickets. ✓

The rest of the tickets sold are adult tickets. ✓

The cost of an adult ticket is £13.60

Work out the cost of a child ticket.

600 = £7200

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

600 ÷ 4 = 150 tickets

the rest = adults

600 - 150 = 450 tickets

450 × 13.60
= £6120

7200 - 6120
= 1080

1 child ticket = 1080 ÷ 150
= £7.20

£ .... 7.20 ....

(Total for Question 1 is 4 marks)

2 Orange squash is made from orange juice and water.

Sean has two different cartons of orange squash, carton **P** and carton **Q**.
The table gives information about the two cartons.

Carton P	Carton Q
Total volume of orange squash is 250 millilitres 30% of the total volume is **orange juice** and the remainder is water	Total volume of orange squash is 250 millilitres 160 millilitres of the total volume is **water** and the remainder is orange juice

Work out the difference in the volume of orange juice in carton **P** and the volume of orange juice in carton **Q**.

SQUASH = JUICE + WATER

P
250ml = 30%   250 - 75
       0.3 × 250   = 175ml.
       = 75 ml + 175 ml

Q
250ml = 90ml + 160ml
        250 - 160
        = 90 ml

Difference = 90 - 75 = 15

.................................15................................ millilitres
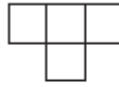
(Total for Question 2 is 3 marks)

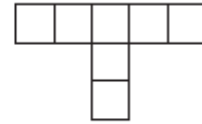**3** A sequence of patterns is made from squares.
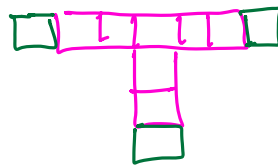
Pattern number 1 Pattern number 2 Pattern number 3

(*a*) In the space below, draw Pattern number 4

Pattern number 4

(1)

(*b*) Complete the table.

Pattern number	1	2	3	4	5	6	7	8
Number of squares	1	4	7	10	13	16	19	22

+3 +3 +3 +3

(1)

(*c*) Work out the number of squares in Pattern number 8

.... 22 ....

(1)

Angus says

"there are 42 squares in Pattern number 15"

Angus is incorrect.

9 10 11 12 13 14 15
25 28 31 34 37 40 43

(*d*) Explain why.

.... There are 43 squares not 42 ....

....

....

(1)

(Total for Question 3 is 4 marks)

4   The table gives information about the costs of sending parcels of different weights.

Weight (w kg)	Cost of sending a parcel
$0 < w \le 1$	£6.00
$1 < w \le 2$	£9.02
$2 < w \le 5$	£15.85
$5 < w \le 10$	£21.90

(handwritten notes: ← 1.3 next to £9.02 row; ← 8kg next to £21.90 row)

Peony has one parcel of weight 1.3 kg and another parcel of weight 8 kg to send to two different places.

(*a*) Work out the total cost of sending these two parcels.

(handwritten: 9·02 + 21·90)

£ *(handwritten: 30·92)*

(2)

Gryffyn sends 3 parcels each to a different place.

One of the parcels has a weight of 1.5 kg and another of the parcels has a weight of 2.8 kg

The total cost of sending the 3 parcels is £33.89

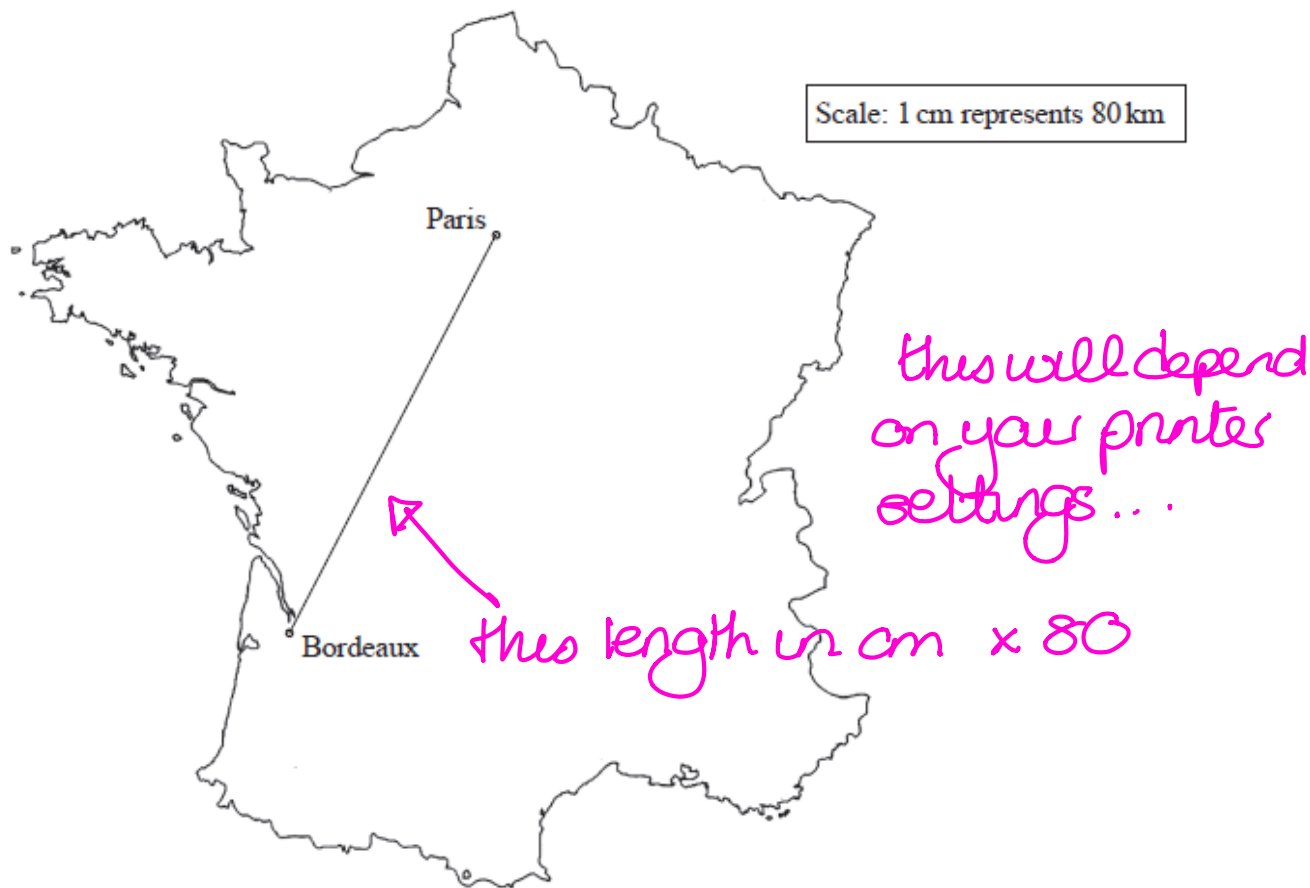(*b*) Work out the greatest possible weight of the third parcel.

(handwritten:
1.5kg = 9·02
2·8kg = 15·85 +
24·87
33·89 − 24·87 = 9·02
so greatest weight
)

(handwritten answer: = 2) kg

(3)

(Total for Question 4 is 5 marks)

5   Here is a scale drawing showing the positions of Paris and Bordeaux.

Scale: 1 cm represents 80 km

Paris

Bordeaux

this will depend on your printer settings...

this length in cm × 80

Alain drives from Paris to Bordeaux.
The distance that he drives is 590 km.

This distance is greater than the actual straight line distance between Paris and Bordeaux.

How much greater?
Show your working clearly.

so   6·2cm × 80 = 496 km

590 - 496 = 94

.................................94................................ km

(Total for Question 5 is 4 marks)

6 Here is a number machine.

input $\longrightarrow$ × 5 $\longrightarrow$ − 7 $\longrightarrow$ output

(*a*) Work out the output when the input is 9

9×5 $45 - 7$
$= 45$ $= 38$

............38............

(1)

Here is a different number machine.

$30 \div 5 = 6$

input $\longrightarrow$ ÷ 5 $\longrightarrow$ ×3 $\longrightarrow$ output

18

(or +12)
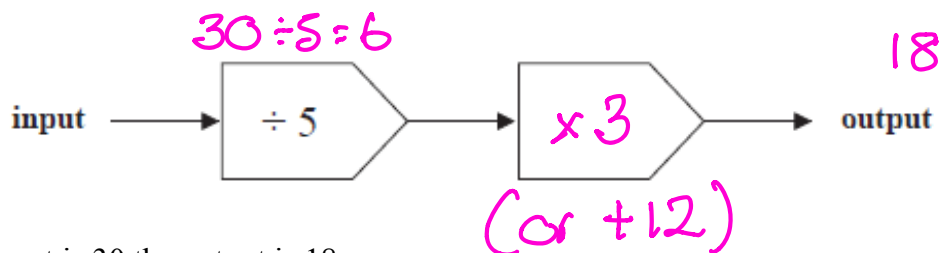
When the input is 30 the output is 18

(*b*) Find a suitable way to complete the number machine.

(1)

The following rule is used to work out the total cost, in euros, of hiring a cement mixer.

Total cost = 8 euros per day plus 5 euros

James hires a cement mixer for 3 days.

(*c*) Work out the cost to James of hiring the cement mixer.

$8 \times 3 = 24$
$24 + 5 = 29$

............29............ euros

(1)

The cost to Sophia of hiring a cement mixer is 61 euros.

(*d*) For how many days does Sophia hire the cement mixer?

$61 - 5 = 56$
$56 \div 8 = 7$

............7............ days

(2)

(Total for Question 6 is 5 marks)

7 Luca has 5 kg of chopped tomatoes.
He also has some empty tins.

When full, each tin holds 350 g of chopped tomatoes.

Luca fills as many tins as possible with the chopped tomatoes.

Work out the weight of the chopped tomatoes remaining after Luca has filled as many tins as possible.

Give the units of your answer.

$$5kg = 5000g$$

$$5000 \div 350 = 14.28...$$

so 14 cans

$$14 \times 350 = 4900 \text{ in cans}$$

$$\text{left} = 5000 - 4900$$

$$= 100g$$

.... 100g ....

(Total for Question 7 is 4 marks)

8 There are 120 cyclists in a cycling club.
There are 67 professional cyclists and the rest are amateur cyclists.
Each of these cyclists was asked to name their favourite type of bike.

The two-way table shows some information about their answers.

	Road bike	**Mountain bike**	**Hybrid bike**	Total
Professional	26	22	19	67 ✓
Amateur	13	32	8	53
Total	39	54	27	120

(*a*) Complete the table.

$120 - 67 = 53$ $120 - (39 + 54) = 27$

$39 - 26 = 13$ $53 - (13 + 32) = 8$

$54 - 32 =$ $27 - 8 = 19$

(3)

(*b*) Work out the percentage of the cyclists who answered Mountain bike.

$$\frac{54}{120} \times 100 = 45$$

.................................45.................................%

(2)

Jacob is going to draw a pie chart for the age groups of the 120 cyclists.
There are 41 people in the 'over 60' age group.

(*c*) Work out the size of the angle for the sector representing the 'over 60' age group.

$$\frac{41}{120} \times 360 = 123$$

.................................123.................................°

(2)

(Total for Question 8 is 7 marks)

9   Find the highest common factor (HCF) of 130 and 208
Show your working clearly.

$$130 = \textcircled{2} \times 5 \times \textcircled{13}$$

$$208 = \textcircled{2} \times 2 \times 2 \times 2 \times \textcircled{13}$$

$$HCF = 2 \times 13$$
$$= 26$$

26

(Total for Question 9 is 2 marks)

10 (*a*) Write 6.25×10^{-4} as an ordinary number.
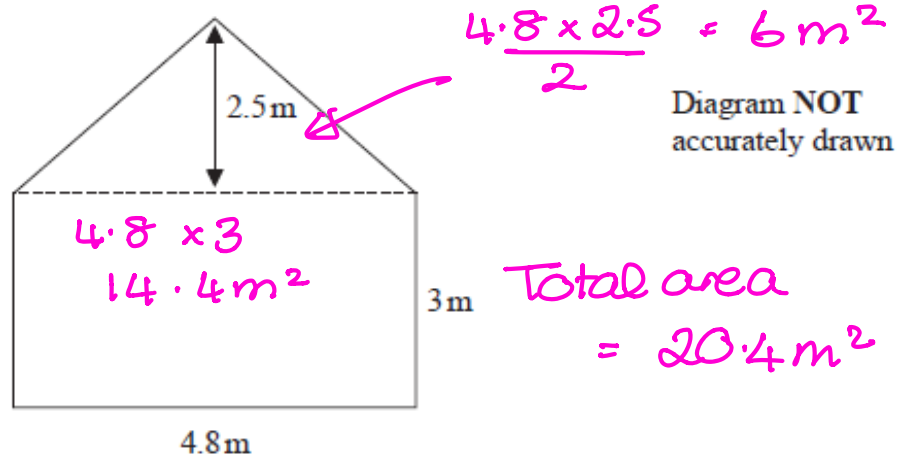
0·000625

(1)

(*b*) Work out $(2.4 \times 10^{12}) \div (9.6 \times 10^{4})$
Give your answer in standard form.

2.5×10^{7}

(2)

(Total for Question 10 is 3 marks)

11 Here is a floor plan of a stage.
The plan is formed from a triangle and a rectangle.

$\dfrac{4.8 \times 2.5}{2} = 6m^2$

2.5 m

Diagram **NOT** accurately drawn

4.8×3
$14.4m^2$

3 m

Total area
$= 20.4m^2$

4.8 m

The stage manager is going to paint the floor.

One tin of paint covers an area of 1.8 m^2
One tin of paint costs £16.40

Paint can only be bought in full tins.

The stage manager has £190 to spend.

Does the stage manager have enough money to buy enough tins to paint all of the floor?
Show your working clearly.

Tins needed = $20.4 \div 1.8$
$= 11.33..$ so 12 tins needed

Cost $= 12 \times 16.40$
$= 196.80$

No, he does not have enough
$196.80 > 190$

(Total for Question 11 is 5 marks)
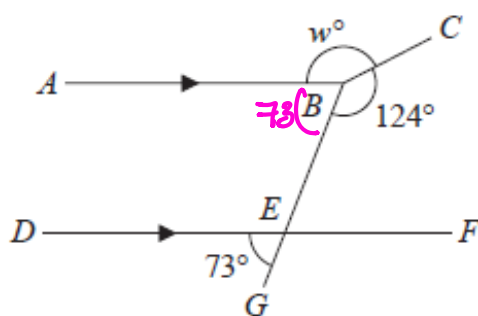
12 The diagram shows two parallel lines *AB* and *DEF*

Diagram **NOT** accurately drawn

BEG is a straight line.

angle *DEG* = 73°   angle *EBC* = 124°   angle *ABC* = *w*°

Work out the value of *w*

Give reasons for each stage of your working.

$ABE = 73$ corresponding angles are equal

$360 - (73 + 124) = 360 - 197$

$= 163$

angles around a point $= 360°$

w = ...**163**.............

(Total for Question 12 is 4 marks)

13 The frequency table shows information about the number of cookies made by each of the 21 people in a cookery class.

Number of cookies made	Frequency
10	1
11	7
12	2
13	5
14	4
15	2

(handwritten annotations: 11 ← 7, 1, 8, 10, ← 10·5)

(*a*) Write down the mode of the number of cookies made.

......................11..............................
(1)

(*b*) Find the median number of cookies made.

$21 \div 2 = 10.5$

......................13..............................
(2)

(*c*) Find the total number of cookies made by the 21 people in the cookery class.

$10 \times 1 = 10$
$11 \times 7 = 77$
$12 \times 2 = 24$ $+$ $= 262$
$13 \times 5 = 65$
$14 \times 4 = 56$
$15 \times 2 = 30$

......................262 cookies..............................
(2)

(Total for Question 13 is 5 marks)

14 There are 380 students in a Sixth Form.
The students are either in the Upper Sixth or in the Lower Sixth.

The number of students in the Upper Sixth is 20 fewer than the number of students in the Lower Sixth.

$\frac{2}{5}$ of the Upper Sixth students study mathematics.

32% of the Lower Sixth students study mathematics.
Work out the total number of students in the Sixth Form who study mathematics.

380

US   -20   L.S
         = 360
         360 ÷ 2
         = 180

180   200

$\frac{2}{5}$ = 180 ÷ 5 × 2   32% = 0.32 × 200
    = 72   = 64

Total = 72 + 64
      = 136

136

(Total for Question 14 is 4 marks)

15 The diagram shows a pentagon.

Handwritten annotations at top right:
3 sides = 180
4 sides = 360
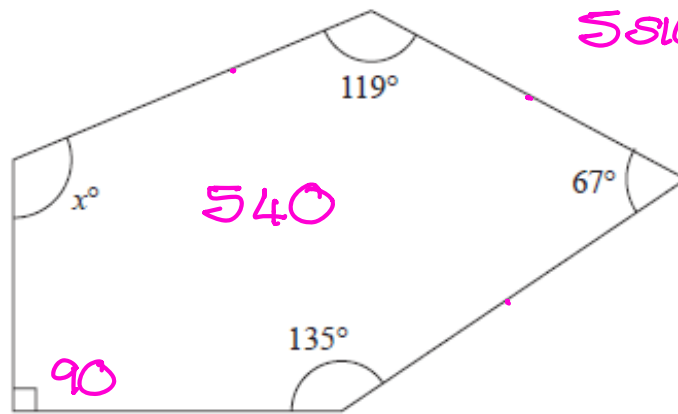5 sides = 540

119°

67°

$x°$ 540

Diagram **NOT** accurately drawn

135°

90

Work out the value of *x*

540 − (90 + 135 + 67 + 119)

= 540 − 411

= 129

$x =$ 129

(Total for Question 15 is 3 marks)

16 Last season, Alisha and Jaya scored goals for their team in the ratio 4 : 7
Jaya scored 39 more goals than Alisha.

Work out the number of goals Alisha scored.

A : J
4   3   7
39 ÷ 3 = 13
4 × 13   7 × 13
52   91

52

(Total for Question 16 is 3 marks)

17 80 students entered a dancing competition.

The table gives information about the length of time, in minutes, for which each student spent dancing.

Time (m)	Frequency
$0 < m \leq 12$ **6**	**×** 11 **= 66**
$12 < m \leq 24$ **18**	**×** 25 **= 450**
$24 < m \leq 36$ **30**	**×** 23 **= 690**
$36 < m \leq 48$ **42**	**×** 15 **= 630**
$48 < m \leq 60$ **54**	**×** 6 **= 324**

+ = 2160

Work out an estimate for the mean length of time the students spent dancing.

2160 ÷ 80 = 27

........................**27**........................ minutes

(Total for Question 17 is 4 marks)

18 Shane bought a car.

The amount Shane paid for the car was £32 000

Theresa also bought a car. To pay for this car, Theresa paid a deposit of £18 000 together with 14 monthly payments of £1160

Theresa paid more for her car than Shane paid for his car.

(*a*) Work out how much more Theresa paid as a percentage of the amount Shane paid.

S
32000

T
14 × 1160 = 16240
Plus   18000
_____
34 240

Difference = 34240 − 32000
           = 2240

% $\frac{2240}{32000}$ × 100

............................7............................%

(4)

Kylie bought a van.

After 1 year, the value of the van was £39 865
During this year, the value of the van decreased by 15%

(*b*) Work out the value of the van when Kylie bought it.

100%
85%   15%
39865

85% = 39865
1% = 469
100% = 46900

£..........46900..........

(3)

(Total for Question 18 is 7 marks)

19 Matteo is going to invest £5000 for two years.

He can invest his money in Bank **G** or in Bank **H**.

Bank G
1.6% per year compound interest

1.016

Bank H
2.9% interest added after two years

1.029

The total amount of interest Matteo would receive at the end of two years from Bank **G** is more than the amount of interest Matteo would receive at the end of two years from Bank **H**.

How much more?

G

5000×1.016^2

$= 5161.28$

interest 161.28

H

5000×1.029

$= 5145$

145

Difference $= 161.28 - 145$

$= 16.28$

£........16.28........

(Total for Question 19 is 4 marks)

_____

TOTAL FOR PAPER IS 80 MARKS