Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Simplify $e + e + e + e + e$

5e

(Total for Question 1 is 1 mark)

2 Write $\frac{3}{4}$ as a decimal.

0.75

(Total for Question 2 is 1 mark)

3 Change 60 millimetres into centimetres.

1cm = 10mm

6cm = 60mm

6 centimetres

(Total for Question 3 is 1 mark)

4 Write down a multiple of 8 that is between 25 and 35

8 16 24 32 40

32

(Total for Question 4 is 1 mark)

5 Angle A is 53°

What type of angle is angle A?

Acute

(Total for Question 5 is 1 mark)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

6 Samina works in a shop that sells pens.

The table shows the number of blue pens and the number of red pens Samina sold in each of three months.

Month	Blue pens	Red pens
April	33	20
May	40	14
June	27	15

(a) Work out the total number of blue pens and red pens Samina sold in June.

27 + 15

42

(1)

Samina says,

"In these three months, in total, I sold more than twice as many blue pens as red pens."

(b) Is Samina correct?
You must show how you get your answer.

BLUE 33 + 40 + 27 = 100

RED 20 + 14 + 15 = 49

2 x red = 49 x 2
= 98

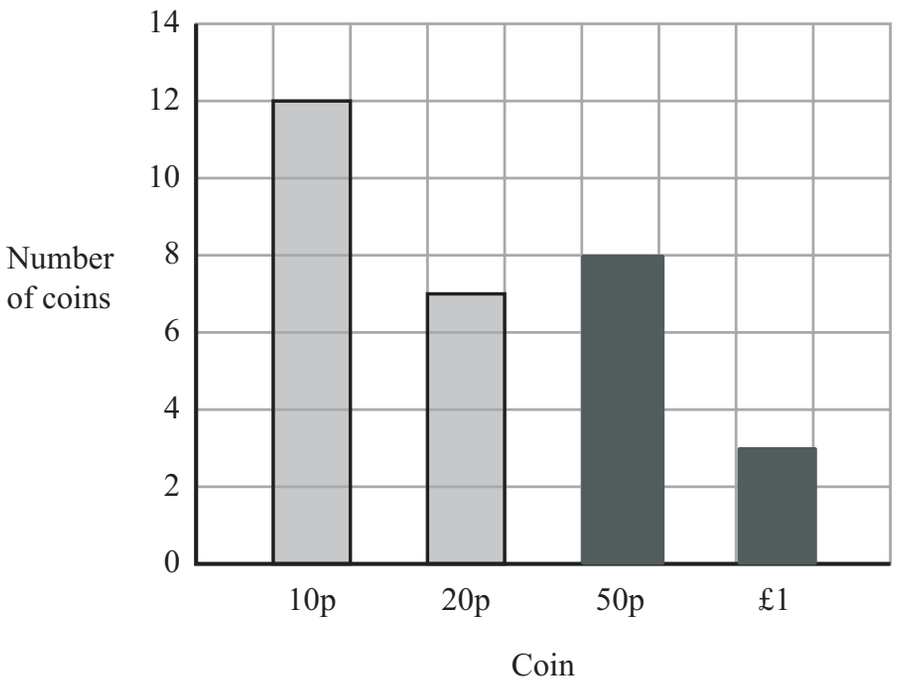
Samina is correct 100 > 98

(3)

(Total for Question 6 is 4 marks)

7 There are only 10p coins, 20p coins, 50p coins and £1 coins in a bag.

The bar chart shows information about the number of 10p coins and the number of 20p coins in the bag.



There are eight 50p coins in the bag.
There are three £1 coins in the bag.

(a) Use this information to complete the bar chart.

(2)

(b) Show that the total amount of money in the bag is less than £10

12 x 10p = £1·20
7 x 20p = £1·40
8 x 50p = £4
3 x £1 = £3

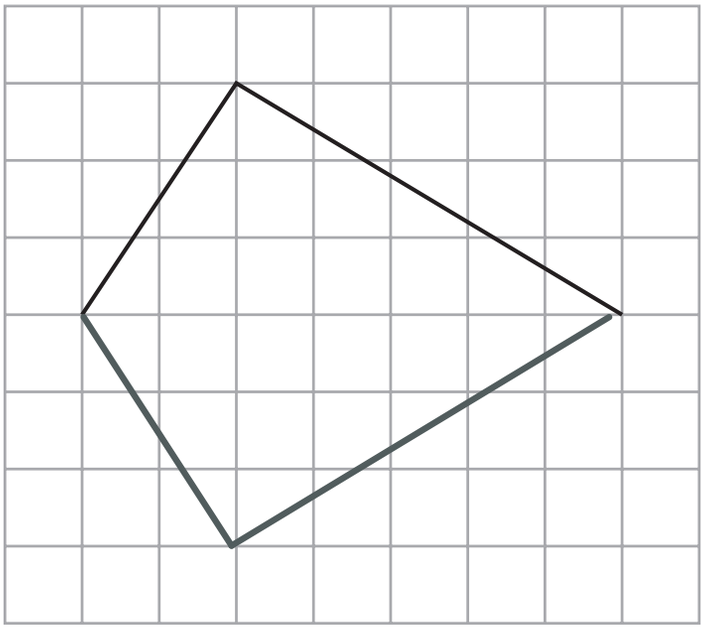
TOTAL 1·20 + 1·40 4 3 = 9·60

£9·60 < £10

(3)

(Total for Question 7 is 5 marks)

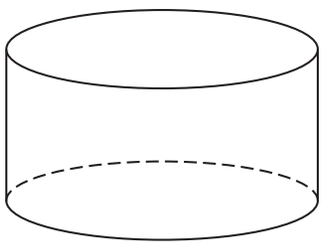
8 The diagram shows two sides of a kite.



(a) On the grid, complete the kite.

(1)

(b) What is the mathematical name of this solid shape?



cylinder

(1)

(Total for Question 8 is 2 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

9 Greg is x years old.

Greg is 5 years older than Katy.

(a) Write down an expression, in terms of x, for Katy's age.

G K
x x-5

$x - 5$

(1)

Carl is twice as old as Greg.

(b) Write down an expression, in terms of x, for Carl's age.

G C
x 2x

$2x$

(1)

(c) Solve $4y = 12$

$y = \frac{12}{4}$
$= 3$

$y = 3$

(1)

(Total for Question 9 is 3 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

10 (a) Write 23 619 to the nearest 1000

23000 ↑ 24000

24000

(1)

(b) Work out an estimate for the value of 5.9×98.1

$5.9 \approx 6$

$98.1 \approx 100$

so $6 \times 100 = 600$

600

(2)

(Total for Question 10 is 3 marks)

11 (a) Work out $\frac{5}{8} - \frac{1}{4}$

$\frac{1}{4} = \frac{2}{8}$

$\frac{5}{8} - \frac{2}{8}$

$= \frac{3}{8}$

$\frac{3}{8}$

(2)

(b) Work out $\frac{2}{5}$ of 40

$\frac{1}{5} = 40 \div 5 = 8$

so $\frac{2}{5} = 8 \times 2 = 16$

16

(2)

(Total for Question 11 is 4 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

12 Here is part of a train timetable from Liverpool to Birmingham.

Liverpool	0807	0847	0907
Runcorn	0825	0903	0926
Crewe	0853	0922	0955
Stafford	0911	0951	1014
Wolverhampton	0930	–	1031
Birmingham	0950	1034	1050

(a) Which train should take the least time to go from Liverpool to Crewe?
You must show how you get your answer.

0807 train takes 53 - 7 = 46 mins

0847 train takes 13 + 22 = 35 mins

0907 train takes 55 - 7 = 48 mins

The 0847 train takes the least time.

(3)

Rose gets to the station in Wolverhampton at 0925
She wants to catch the next train to Birmingham.

This train is delayed by 35 minutes.

(b) How many minutes does Rose have to wait for the train?

W. 0925 → 0930 train delayed until 10:05

so waits from 925 until 1005 (35 + 5) = 40

40 ..... minutes

(2)

(Total for Question 12 is 5 marks)

DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA

13 Here is a number machine.

(a) Find the output when the input is 6

$6 \times 3 = 18 \rightarrow 18 - 8 = 10$

10

(1)

(b) Find the input when the output is −11

$\leftarrow -11 + 8 = -3$

$-3 \div 3 = -1$

−1

(2)

(Total for Question 13 is 3 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

14 A road has a length of 1.6 kilometres. = 1600m

The road is shown on a map with a scale of 1 : 20 000

Work out the length, in centimetres, of this road on the map.

map road

1cm = 20 000 cm 1000m = 1m

1cm = 200 m

x8 x8

8cm = 1600m

80

8 centimetres

(Total for Question 14 is 3 marks)

15 Work out 1.35 × 48

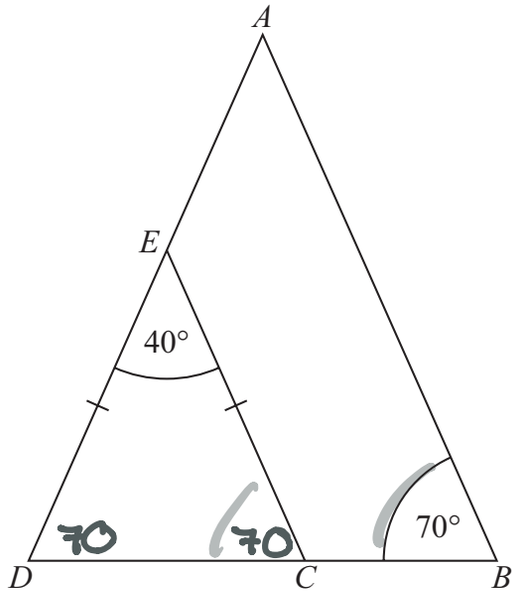
135
x 48
1080
5400
6480

64.80

64.8

(Total for Question 15 is 3 marks)

16



AED and *BCD* are straight lines.
ED = *EC*

Show that *EC* is parallel to *AB*.
Give a reason for each stage of your working.

EDC = ECD => $\frac{180 - 40}{2} = 70$

base angles in an isosceles triangle are equal

so ECD = ABD because corresponding angles are equal in parallel lines.

(Total for Question 16 is 4 marks)

17 Sam wants to use this recipe to make 15 pancakes.

5 pancakes

100 ÷ 2 = 50g
200 ÷ 2 = 100g
40 ÷ 2 = 20g
2 ÷ 2 = 1 egg

Ingredients for 10 pancakes
100 g flour
200 m*l* milk
40 g butter
2 eggs

15 pancakes

100 + 50 = 150g
200 + 100 = 300g
20 + 40 = 60g
2 + 1 = 3 eggs.

Sam has

200 g flour
250 m*l* milk
70 g butter
5 eggs

Does Sam have enough flour, enough milk, enough butter and enough eggs to make 15 pancakes?
You must show all your working.

Has 200g flour needs 150g ✓

has 250ml milk needs 300ml x

has 70g butter needs 60g ✓

has 5 eggs needs 3 eggs ✓

Sam does not have enough milk, but has enough flour, butter and eggs.

(Total for Question 17 is 3 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

18 Here are the heights, in cm, of 12 children.

146	135	142	150	138	149
152	146	137	154	147	144

Show this information in a stem and leaf diagram.

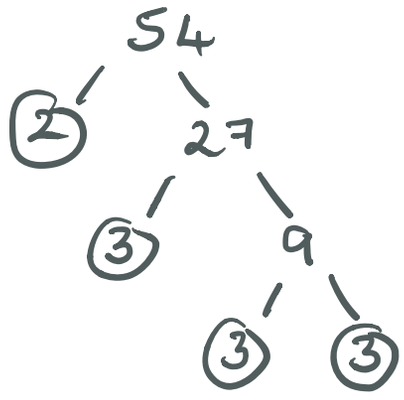
13 | 5 8 7
14 | 6 2 9 6 7 4
15 | 0 2 4

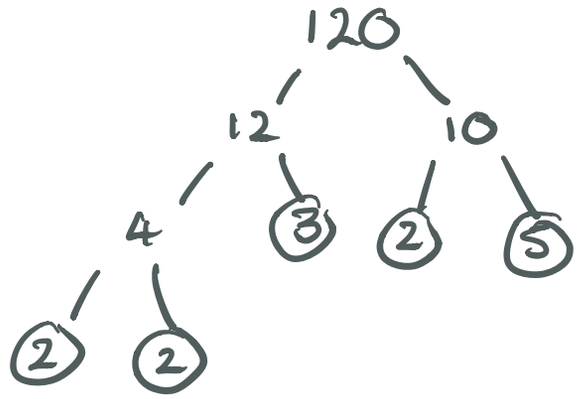
13	5 7 8
14	2 4 6 6 7 9
15	0 2 4

Key: 13|5 = 135

(Total for Question 18 is 3 marks)

19 Find the highest common factor (HCF) of 54 and 120





$54 = 2 \times 3 \times 3$
$120 = 2 \times 2 \times 2 \times 3 \times 5$
so HCF $= 2 \times 3$

6

(Total for Question 19 is 2 marks)

20 There are only red counters, white counters, blue counters and green counters in a bag.

Chris is going to take at random a counter from the bag.

The table shows the probability that he will take a red counter and the probability that he will take a white counter.

2x x

Colour	red	white	blue	green
Probability	0.3	0.1	0.4	0.2

0.6

There are twice as many blue counters as there are green counters in the bag.

(a) Work out the probability that Chris will take a blue counter.

$0.3 + 0.1 = 0.4$

$1 - 0.4 = 0.6$

$3x = 0.6$

$x = 0.2$

0.4

(3)

There are 45 red counters in the bag.

(b) Work out the total number of counters in the bag.

$0.3 : 45$

$\div 3 \quad \div 3$

$0.1 : 15$

$\times 10 \quad \times 10$

$1 : 150$

150

(2)

(Total for Question 20 is 5 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

21 (a) Complete the table of values for $y = x^2 + x - 4$

0^2+0-4

x	–3	–2	–1	0	1	2
y	2	-2	–4	-4	-2	2

2^2+2-4
$=2$

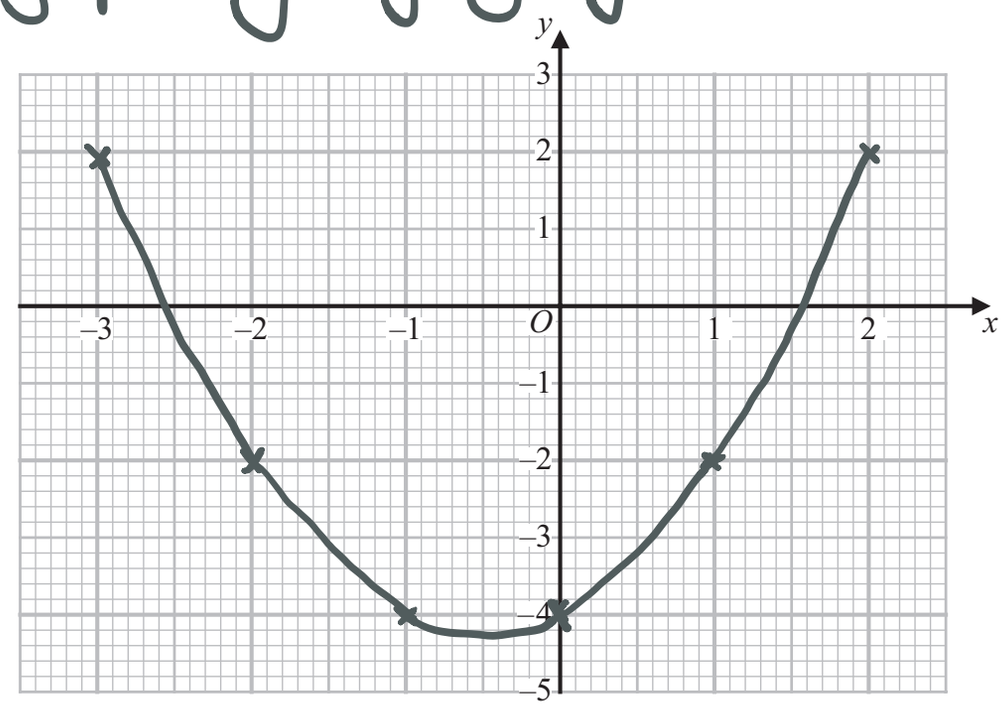
$(-2)^2+(-2)-4$
$=4-2-4$
$=-2$

1^2+1-4
$=-2$

(2)

(b) On the grid, draw the graph of $y = x^2 + x - 4$ for values of x from –3 to 2

Your graph may vary slightly



(2)

(c) Write down the coordinates of the turning point of the graph of $y = x^2 + x - 4$

x coordinate = -0·5

(-0·5 ; -4·25)

(1)

(Total for Question 21 is 5 marks)

22 There are 280 chocolates in a box.
There are only dark chocolates, milk chocolates and white chocolates.

$\frac{1}{7}$ of the 280 chocolates are dark chocolates.

The number of milk chocolates : the number of white chocolates = 1 : 3

The number of white chocolates : the number of dark chocolates = n : 1

(a) Work out the value of n.
You must show all your working.

280 D

$\frac{1}{7}$ of 280

= 280 ÷ 7

= 40

M W

280 - 40

= 240

240 ÷ 4

= 60

M : W	TOTAL
1 : 3	4
×60 ×60	240 ↓ ×60
60 : 180	

RATIO W : D

180 : 40

÷10 ÷10

18 : 4

9 : 2

4.5 : 1 so n = 4.5

n = 4.5

(5)

10 milk chocolates from the box are eaten.

(b) Does this affect your answer to part (a)?
Give a reason for your answer.

No, because the number of white and dark chocolates does not change

(1)

(Total for Question 22 is 6 marks)

23 Work out $5.7 \times 10^2 + 9.8 \times 10^3$
Give your answer in standard form.

$5.7 \times 10^2 = 570$

$9.8 \times 10^3 = 9800$

SC 570 +
9800
10370
1

10370

$= 1.037 \times 10^4$

1.037×10^4

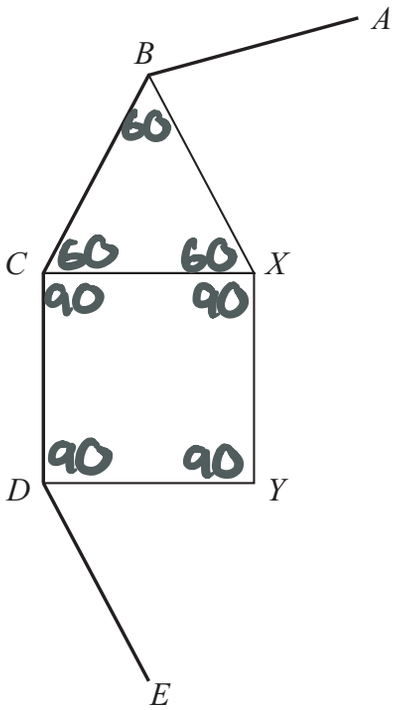
(Total for Question 23 is 3 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

24 *AB*, *BC*, *CD* and *DE* are four sides of a regular polygon with *n* sides.



2 180 ÷ 3
= 60

3 360 ÷ 4
= 90

1 interior angle
BCD
= 60 + 90
= 150

BCX is an equilateral triangle.
CDYX is a square.

Work out the value of *n*.
You must show all your working.

4 Exterior angle
= 180 - 150
= 30

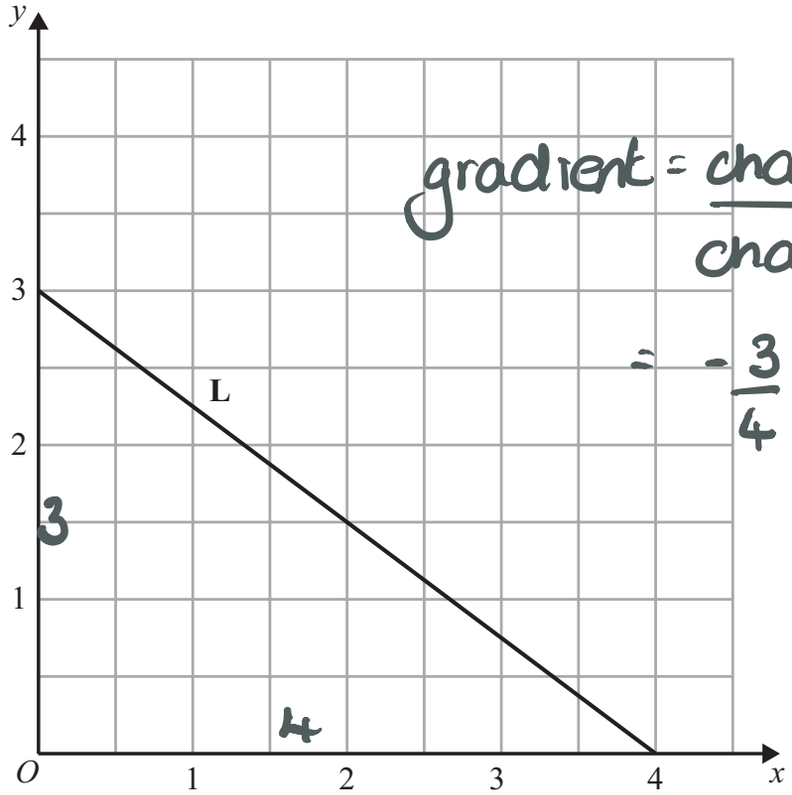
so number of sides n = 360 ÷ 30
= 12

n = 12

(Total for Question 24 is 4 marks)

DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA

25 The straight line **L** is shown on the grid.



y intercept = 3

gradient = change in y / change in x = $-\frac{3}{4}$

3

4

Find an equation for **L**.
Give your answer in the form $y = mx + c$

$y = -\frac{3}{4}x + 3$

(Total for Question 25 is 3 marks)

Turn over for Question 26

26 $\mathbf{c} = \begin{pmatrix} 7 \\ 4 \end{pmatrix}$ $\mathbf{d} = \begin{pmatrix} 2 \\ -1 \end{pmatrix}$

Work out $2\mathbf{c} + 3\mathbf{d}$
Give your answer as a column vector.

$2\begin{pmatrix} 7 \\ 4 \end{pmatrix} + 3\begin{pmatrix} 2 \\ -1 \end{pmatrix}$

$= \begin{pmatrix} 14 \\ 8 \end{pmatrix} + \begin{pmatrix} 6 \\ -3 \end{pmatrix} = \begin{pmatrix} 14+6 \\ 8+-3 \end{pmatrix}$

$\begin{pmatrix} 20 \\ 5 \end{pmatrix}$

(Total for Question 26 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS

DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA