Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

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

1 mark 5e

(Total for Question 1 is 1 mark)

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

1 mark 0.75

(Total for Question 2 is 1 mark)

3 Change 60 millimetres into centimetres.

1cm = 10mm

6cm = 60mm

1 mark 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

1 mark 32

(Total for Question 4 is 1 mark)

5 Angle A is 53°

What type of angle is angle A?

1 mark Acute

(Total for Question 5 is 1 mark)

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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

1 mark 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

1 mark for either of these

RED 20 + 14 + 15 = 49

1 mark for both of these

2 x red = 49 x 2 = 98

Samina is correct 100 > 98

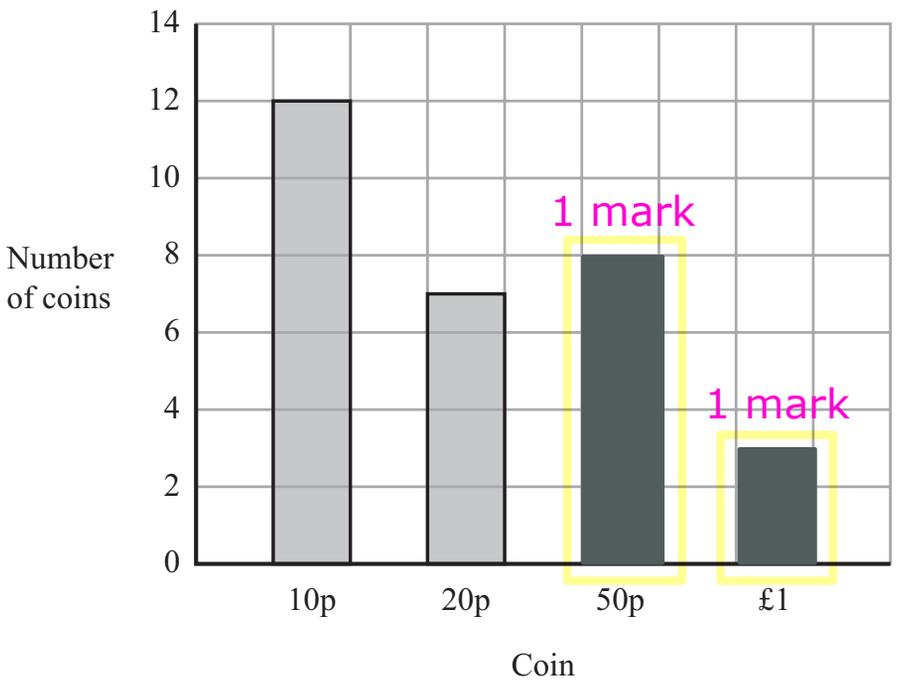
Final mark (WITH supporting figures)

(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

1 mark

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

1 mark for any two of these

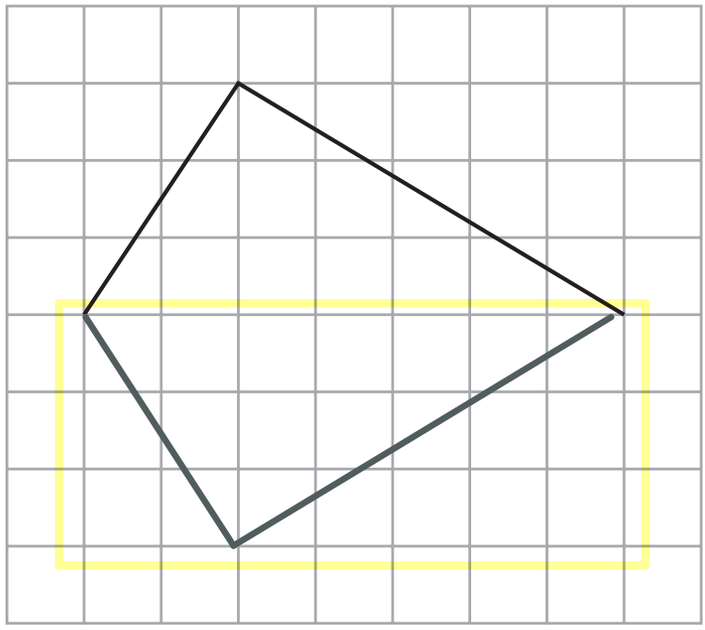
1 mark

£9·60 < £10

(3)

(Total for Question 7 is 5 marks)

8 The diagram shows two sides of a kite.

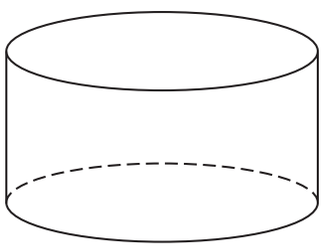


1 mark

(a) On the grid, complete the kite.

(1)

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



1 mark cylinder

(1)

(Total for Question 8 is 2 marks)

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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

1 mark 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

1 mark 2x

(1)

(c) Solve $4y = 12$

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

1 mark

$y =$ 3

(1)

(Total for Question 9 is 3 marks)

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10 (a) Write 23 619 to the nearest 1000

23000 ↑ 24000

1 mark 24000

(1)

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

$5.9 \approx 6$

$98.1 \approx 100$

so $6 \times 100 = 600$

1 mark for 6 or 100 used in a calculation

Final mark 600

(2)

(Total for Question 10 is 3 marks)

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

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

$\frac{5}{8} - \frac{2}{8}$ 1 mark

$= \frac{3}{8}$

Final mark $\frac{3}{8}$

(2)

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

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

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

1 mark

Final mark 16

(2)

(Total for Question 11 is 4 marks)

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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

1 mark for any one of these

2 marks for all of these

The 0847 train takes the least time.

Final mark

(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

1 mark

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

Final mark 40 minutes

(2)

(Total for Question 12 is 5 marks)

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13 Here is a number machine.

(a) Find the output when the input is 6

6 x 3 = 18 → 18 − 8 = 10

1 mark 10

(1)

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

← −11 + 8 = −3

1 mark

−3 ÷ 3 = −1

Final mark −1

(2)

(Total for Question 13 is 3 marks)

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14 A road has a length of 1.6 kilometres.

$1.6 \times 1000 = 1600\text{m}$

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

1 mark

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

map : road

1 cm = 20 000 cm

1000m = 1m

÷100

so 1 cm = 200 m

×8 ×8

8cm = 1600m

1 mark

Final mark 8 centimetres

(Total for Question 14 is 3 marks)

---

15 Work out 1.35×48

6480

$$\begin{array}{r} 135 \\ \times\ 48 \\ \hline 1080 \\ 5400 \\ \hline 6480 \end{array}$$

1 mark

1 mark for digits 648

Final mark 64·8

(Total for Question 15 is 3 marks)

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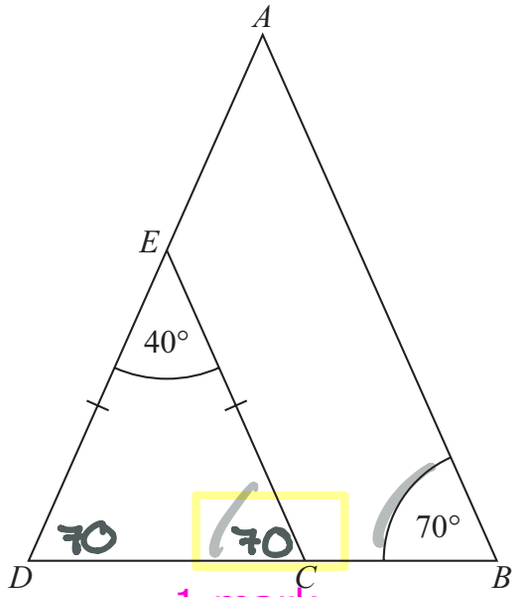
16



1 mark

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

1 mark

base angles in an isosceles triangle are equal

1 mark

so ECD = ABD

because corresponding angles are equal in parallel lines.

1 mark

(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

2 marks for finding the amount needed of all ingredients for 15 pancakes or
1 mark for the amount needed of one ingredient

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 ✗

has 70g butter needs 60g ✓

has 5 eggs needs 3 eggs ✓

Final mark (WITH supporting figures)

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

(Total for Question 17 is 3 marks)

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

2 marks for fully correct ordered diagram

Or 1 mark for unordered diagram with at most one number missing

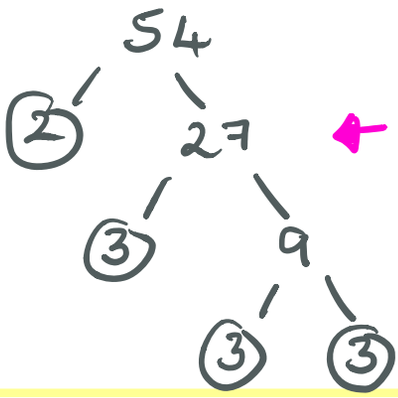
13	5 7 8
14	2 4 6 6 7 9
15	0 2 4

Key: 13|5 = 135

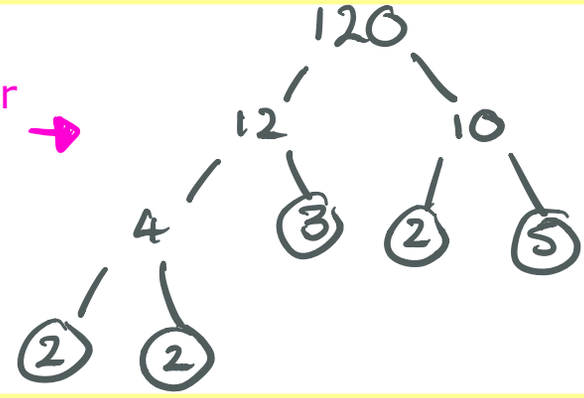
1 mark

(Total for Question 18 is 3 marks)

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



1 mark for either of these



$54 = 2 \times 3 \times 3 \times 3$

$120 = 2 \times 2 \times 2 \times 3 \times 5$

so HCF $= 2 \times 3$

Final mark 6

SPECIAL CASE: 1 mark for an answer of 2 or 3

(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.

Colour	red	white	blue (2x)	green (x)
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.

$0.3 + 0.1 = 0.4$

$1 - 0.4 = 0.6$ 1 mark

$3x = 0.6$ 1 mark

$\div 3$

$x = 0.2$

Final mark 0.4

(3)

There are 45 red counters in the bag.

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

$0.3 : 45$

$\div 3 \quad \div 3$ 1 mark

$0.1 : 15$

$\times 10 \quad \times 10$

$1 : 150$

Final mark 150

(2)

(Total for Question 20 is 5 marks)

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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
$=2$

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

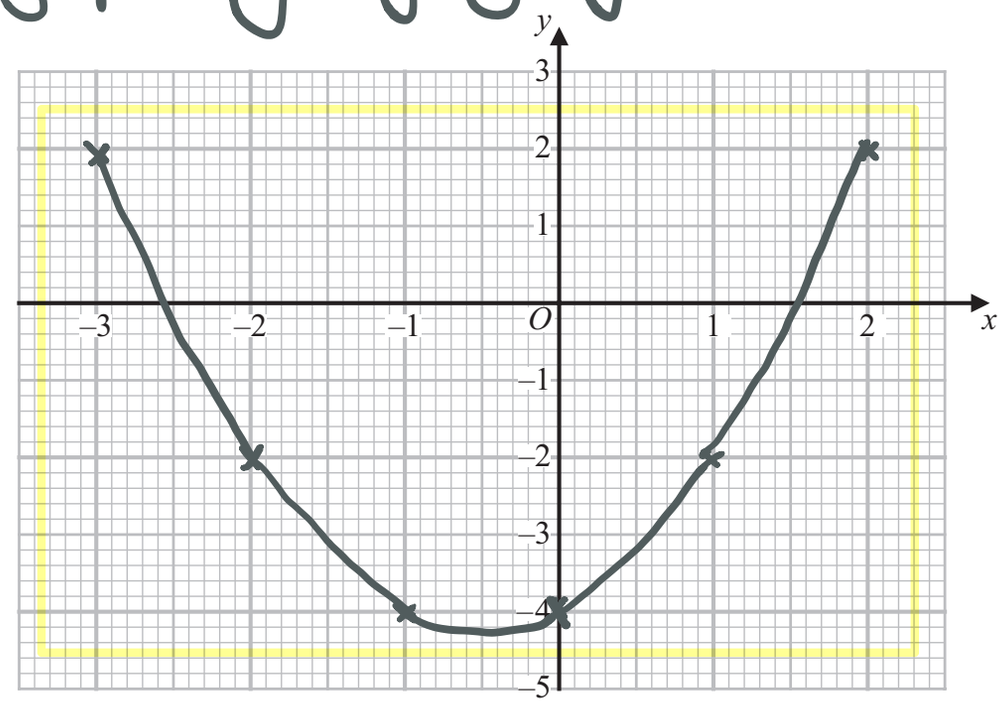
1^2+1-4
$= -2$

2 marks for four correct values or
1 mark for two or three correct values

(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 marks for fully correct graph or
1 mark for plotting at least five points correctly

(2)

(c) Write down the coordinates of the turning point of the graph of $y = x^2 + x - 4$ 1 mark

x coordinate $= -0.5$

(-0.5 , -4.25)

(1)

(Total for Question 21 is 5 marks)

A range will be accepted for the y value based on your graph

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
1 mark

M W

280 - 40
= 240

1 mark
240 ÷ 4
= 60

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

RATIO W : D

180 : 40 1 mark
÷10 ÷10
18 : 4
9 : 2
4·5 : 1 so n = 4·5

Final mark
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 mark

(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.

$5.7 \times 10^2 = 570$ ← 1 mark for either of these

$9.8 \times 10^3 = 9800$ ←

SC 570 + 9800 = 10370

1 mark

10370

$= 1.037 \times 10^4$

Final mark 1.037×10^4

(Total for Question 23 is 3 marks)

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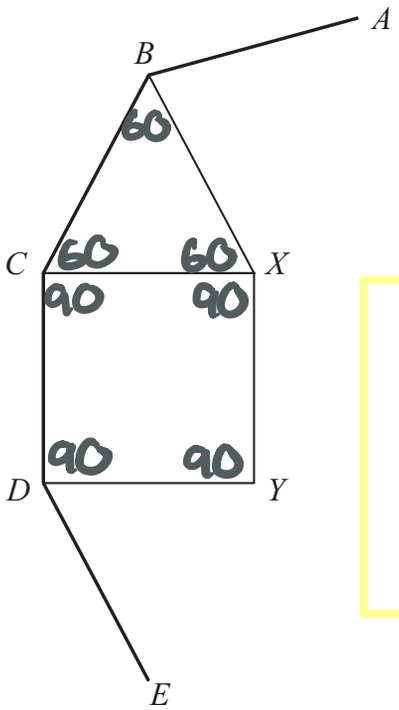
24 *AB*, *BC*, *CD* and *DE* are four sides of a regular polygon with *n* sides.

2 180 ÷ 3
= 60



3 360 ÷ 4
= 90

1 mark

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

1 mark

1 mark

so number of sides n = 360 ÷ 30
= 12

Final mark

n = 12

(Total for Question 24 is 4 marks)

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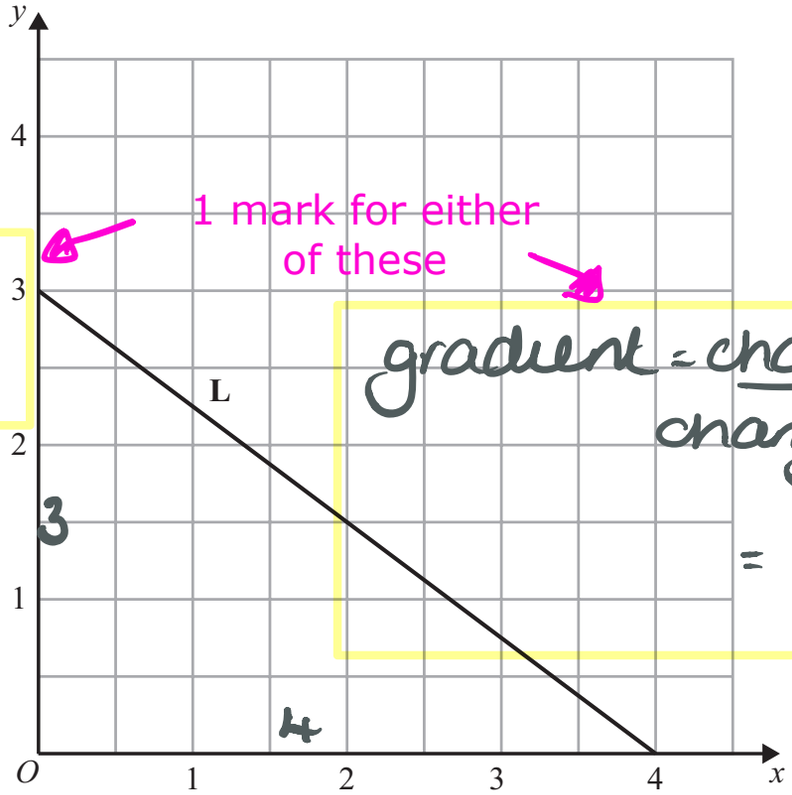
25 The straight line **L** is shown on the grid.



y intercept = 3

1 mark for either of these

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

3

4

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

using gradient

$y = -\frac{3}{4}x + c$ 1 mark

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

(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.

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

1 mark for either of these

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

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

(Total for Question 26 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS

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