

Pre Public Examination
GCSE Mathematics (Edexcel style)
November 2016
Foundation Tier
Paper 3F

Name

Class

TIME ALLOWED
1 hour 30 minutes

INSTRUCTIONS TO CANDIDATES

- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- You are permitted to use a calculator in this paper.
- Do all rough work in this book.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question on the Question Paper.
- **You are reminded of the need for clear presentation in your answers.**
- The total number of marks for this paper is **80**.

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Question	Mark	out of
1		1
2		1
3		1
4		2
5		3
6		2
7		3
8		1
9		3
10		3
11		2
12		3
13		3
14		3
15		3
16		3
17		4
18		3
19		3
20		4
21		3
22		3
23		5
24		2
25		6
26		5
27		1
28		4
Total		80

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

Question 1

Write the number 8264 correct to the nearest hundred.

8300

.....
(Total 1 mark)

Question 2

Work out $\frac{40 - 18}{7 + 4}$

$$\frac{22}{11} = 2$$

2

.....
(Total 1 mark)

Question 3

Work out the reciprocal of 0.25.

$$1 \div 0.25 = 4$$

4

.....
(Total 1 mark)

Question 4

Here is a list of numbers.

2 8 24 49 51

From the list, write down

(i) a multiple of 6

Multiples of 6 are 6, 12, 18, 24, 30...

24

.....

(ii) a square number.

Square numbers are 1, 4, 9, 16, 25, 36, 49, 64, ..

49

.....

(Total 2 marks)

Question 5

There is 1.25 kg of porridge oats in a box.

There is 425 g of porridge oats left in another box.

Work out the total quantity of porridge oats in the two boxes.

$$425\text{g} \div 1000 = 0.425\text{kg}$$

$$0.425 + 1.25 = 1.675 \text{ kg}$$

Or

$$1.25\text{kg} \times 1000 = 1250\text{g}$$

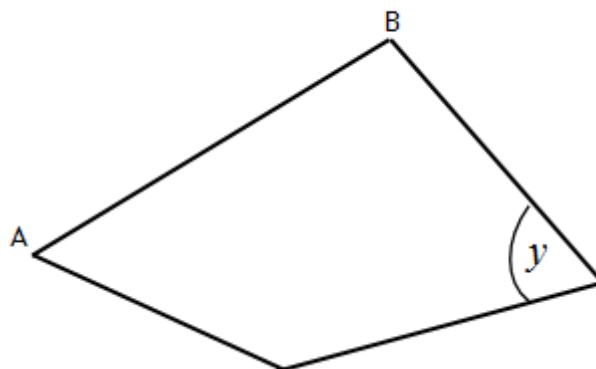
$$1250 + 425 = 1675\text{g}$$

1.675kg or 1675g

.....
(Total 3 marks)

Question 6

Here is a quadrilateral.



This diagram is accurately drawn.

(a) Measure the length of the line AB .

5.5

.....cm
(1)

(b) Measure the size of the angle marked y .

65

.....°
(1)

(Total 2 marks)

Question 7

(a) Solve $2g + 3g + g = 24$

$$\begin{aligned} 6g &= 24 \\ g &= 24 \div 6 \\ g &= 4 \end{aligned}$$

$$g = \overset{4}{\dots\dots\dots} \quad (1)$$

(b) Solve $27 - w = 8$

$$\begin{aligned} -w &= 8 - 27 \\ -w &= -19 \\ w &= 19 \end{aligned}$$

$$w = \overset{19}{\dots\dots\dots} \quad (1)$$

(c) Simplify $e^4 \times e^2$

$$e^{4+2} = e^6$$

$$\overset{e^6}{\dots\dots\dots} \quad (1)$$

(Total 3 marks)

Question 8

Ryan says that the answer to

$$4.6 \times 6.3 = 289.8$$

Without doing the exact calculation, explain why Ryan's answer cannot be correct.

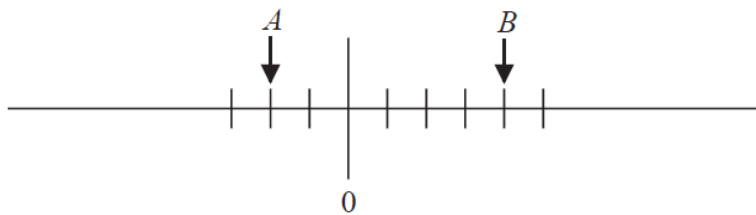
If you estimate the answer the calculation, it'll be $5 \times 6 = 30$. So the answer should not be almost 10 times more than 30. Correct answer is 28.98.

.....
.....

(Total 1 mark)

Question 9

The two numbers, A and B , are shown on a scale.



The difference between A and B is 54.

Work out the value of A and the value of B .

6 equal steps between A and B

so $54 \div 6 = 9$

to find A: $0 - (9 \times 2) = -18$

to find B: $0 + (9 \times 4) = 36$

-18
 $A = \dots\dots\dots$

36
 $B = \dots\dots\dots$

(Total 3 marks)

Question 10

Complete this table of values.

y	$4y - 3$
8	$4 \times 8 - 3 =$ 29
$(65 + 3) \div 4$ = 17	65

(Total 3 marks)

Question 11

The same number is missing from each box.

$$\square \times \square \times \square = 216$$

(a) Find the missing number.

$$\sqrt[3]{216} = 6$$

6

.....
(1)

(b) Work out 3^4 .

$$3 \times 3 \times 3 \times 3 = 81$$

81

.....
(1)

(Total 2 marks)

Question 12

Two square numbers have a sum of 40 and a difference of 32.

What are the numbers?

You must show how you get your answer.

List the first 8 or so square numbers and find two with sum of 40 and difference of 32.

1, 4, 9, 16, 25, 36, 49, 64, ...

$$36 + 4 = 40$$

$$36 - 4 = 32$$

Answer: 36 and 4

(Total 3 marks)

Question 13

Here are the first three terms of a sequence.

41 34 27

Noah says that -1 and -8 are terms in the sequence.

Show that Noah is correct.

The sequence is going down in 7s.

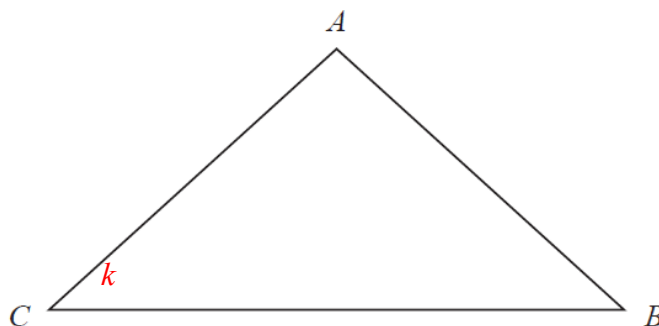
Continuing the sequence: 41, 34, 27, 20, 13, 6, -1 , -8 , ...

So Noah is correct.

(Total 3 marks)

Question 14

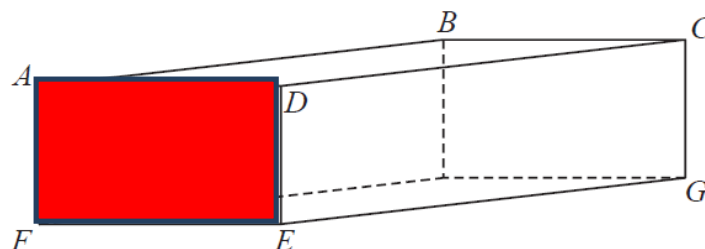
Here is a triangle ABC .



(1)

(a) Mark the angle ACB with the letter k .

Here is a cuboid.



Some of the vertices are labelled.

(b) Shade in the face $ADFE$

(1)

(c) How many vertices does a cuboid have?

8

(1)

(Total 3 marks)

Question 15

There are 12 grams of protein in every 200g of biscuit.

A packet of family sized biscuit weighs 800g.
There are 240 biscuits in the packet.

Each biscuit has the same weight.

Work out the amount of protein in each biscuit.

12 g of protein in 200g of biscuit

So 6 grams of protein in 100g of biscuit

Therefore they'll be 48g (6×8) in 800g of biscuits.

240 biscuits in an 800g packet so each biscuit will have 0.2g ($48 \div 240$) of protein.

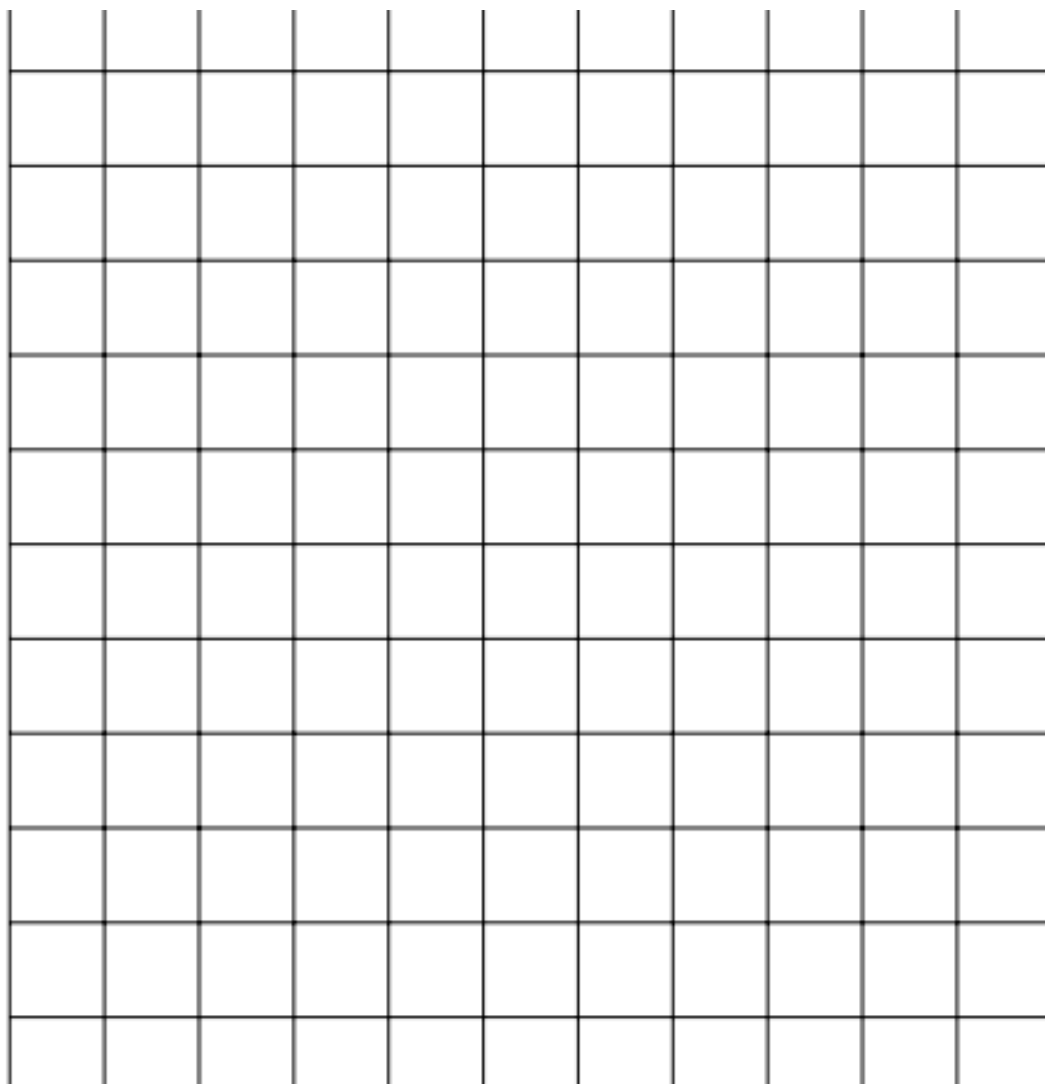
0.2

..... g

(Total 3 marks)

Question 16

Draw 3 rectangles with a perimeter of 18cm.



Dimensions of rectangle should be 7 by 2, 6 by 3, 5 by 4 or 8 by 1.

(Total 3 marks)

Question 17

ABC is an isosceles triangle.

When angle $A = 50^\circ$, there are 3 possible sizes of angle B .

(a) What are they?

$180 - 50 = 130$ (when 50 is not one of the base angles)

$130 \div 2 = 65$

$50 + 50 = 100$ (when 50 is a base angle)

$180 - 100 = 80$

65
 50
 80
^o,^o,^o
(3)

When angle $A = 110^\circ$, there is only one possible size of angle B .

(b) Explain why.

Only one option when an obtuse angle is given.

110 cannot be the base angle because $110 + 110 = 220$ which is more than 180°

.....

(1)

(Total 4 marks)

Question 18

Ben is painting his room orange.

To make orange paint, he mixes 5 litres of red paint with 3 litres of yellow.

- (a) Write down the ratio of the red paint to yellow paint in the form $1 : n$.

Red : yellow

5 : 3 (divide both by 5)

1 : 0.6

1 : 0.6

.....
(1)

- (b) What percentage of the orange paint is yellow?

Total = 8 litres

Percentage of yellow = $\frac{3}{8} \times 100 = 37.5\%$

37.5%

.....
(2)

(Total 3 marks)

Question 19

A 2 litre bottle of cola cost £1.59.

Ada is organising a party and wants to spend £30 on 2 litre bottles of cola.

She is going to get as many 2 litres bottles of cola as possible.

Her local shop has an offer.

2 litre bottles of cola

Buy 3 get 1 free

How many 2 litre bottles of cola can Ada get?

Buy 3 get 1 free means you get 4 bottles for the price of 3

So 4 bottles of cola will cost $£1.59 \times 3 = 4.77$

8 bottles will cost $£9.54$ (4 bottles \times 2)

16 bottles will cost $£19.08$ (8 bottles \times 2)

24 bottles will cost $£28.62$ (16 + 8 bottles)

$£30 - £28.62 = £1.38$

Cannot buy any more bottles with $£1.38$

So total will be 24 bottles.

Ada can buy 24 bottles of cola.

.....
(Total 3 marks)

Question 20

$$\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$$

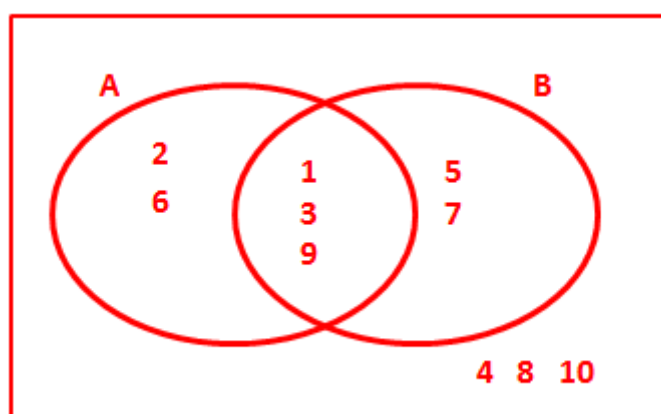
$$A = \{\text{factors of } 18\}$$

$$A \cap B = \{1, 3, 9\}$$

$$A \cup B = \{1, 2, 3, 5, 6, 7, 9\}$$

Draw a Venn diagram for this information.

Factors of 18 are 1, 2, 3, 6, 9, and 18



(Total 4 marks)

Question 21

Here are the marks scored in a test by the girls in class 11C.

5 9 11 12 15 16 16 17 19 21 27

(a) Work out the interquartile range of the girls' marks.

**Median = 16, Lower quartile = 11, Upper quartile = 19
interquartile range = 19 – 11 = 8**

.....
(2)

The boys in class 11C did the same test.

The boys' marks had a range of 23 and an interquartile range of 10 marks.

Gail says that the girls' marks are more spread out than the boys' marks.

(b) Is Gail right?

Tick (✓) the appropriate box.

Yes	No
<input type="checkbox"/>	<input checked="" type="checkbox"/>

Give a reason for your answer.

The girls' range and interquartile range are smaller than the boys' and so the boys' marks are more spread out.

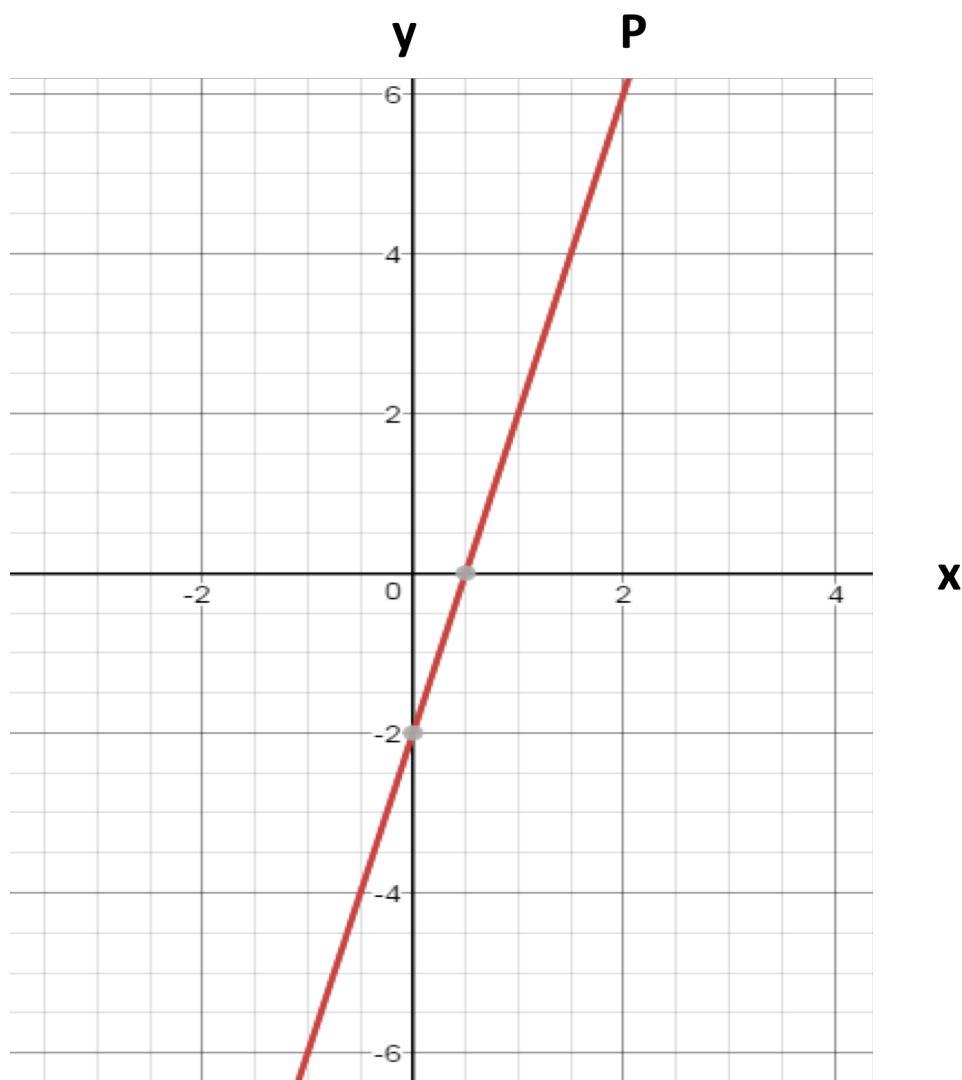
.....
.....

(1)

(Total 3 marks)

Question 22

Line **P** is drawn on the grid below



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

gradient of 4
y intercept of -2
 $y = 4x - 2$

(Total 3 marks)

Question 23

The table shows information about 150 stones that have been collected from a beach.

Stone size	Mass (g)	Frequency
Extra small	$20 < m \leq 40$	36
Small	$40 < m \leq 60$	20
Medium	$60 < m \leq 80$	45
Large	$80 < m \leq 100$	27
Extra large	$100 < m \leq 120$	22

(a) Calculate an estimate for the mean stone size.

$$\begin{aligned}
 & (30 \times 36) + (50 \times 20) + (70 \times 45) + (90 \times 27) + (110 \times 22) \\
 & = 1080 + 1000 + 3150 + 2430 + 2420 \\
 & = 10080 \\
 & 10080 \div 150 = 67.2
 \end{aligned}$$

.....g
(3)

(b) Ben thinks that about $\frac{1}{2}$ of the stones are medium sized as medium is the mode.
Is Ben correct?
You must give a reason for your answer.

**strategy to work out $\frac{1}{2}$ of 150 = 75 and compare to number of medium stones
clear comparison that medium size is not $\frac{1}{2}$ and so Ben is not correct**

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

(Total 5 marks)

Question 24

Factorise $x^2 - 6x - 7$

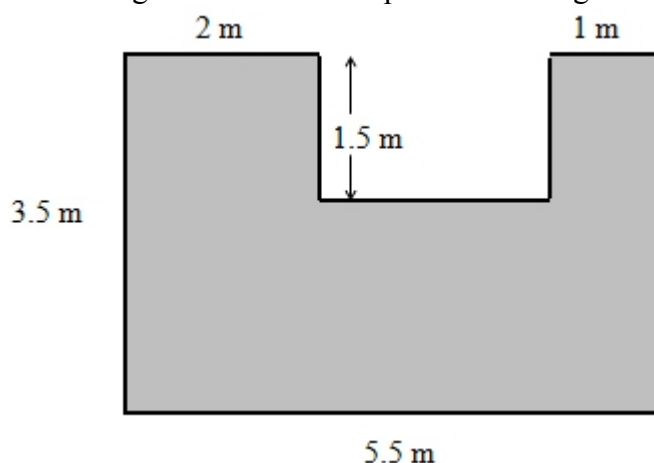
$$\begin{aligned}
 & (x - 7)(x + 1) \\
 & (x - 7)(x + 1) \text{ oe}
 \end{aligned}$$

$$(x - 7)(x + 1)$$

.....
(Total 2 marks)

Question 25

Here is a diagram of Shannon's patio with a vegetable patch cut out of one side.



(a) Work out the area of Shannon's patio

**$3.5 \times 5.5 = 19.25$ $19.25 - (1.5 \times 2.5) = 19.25 - 3.75 = 15.5$
 Alt $(2 \times 3.5) + (1 \times 3.5) + (2 \times 2.5) = 7 + 3.5 + 5 = 15.5$**

..... **15.5**
 m²
 (4)

(b) Shannon wants to paint the patio. Patio paint costs £9 per tin.
 One tin covers 4m² of patio.
 Work out how much the patio paint will cost Shannon.

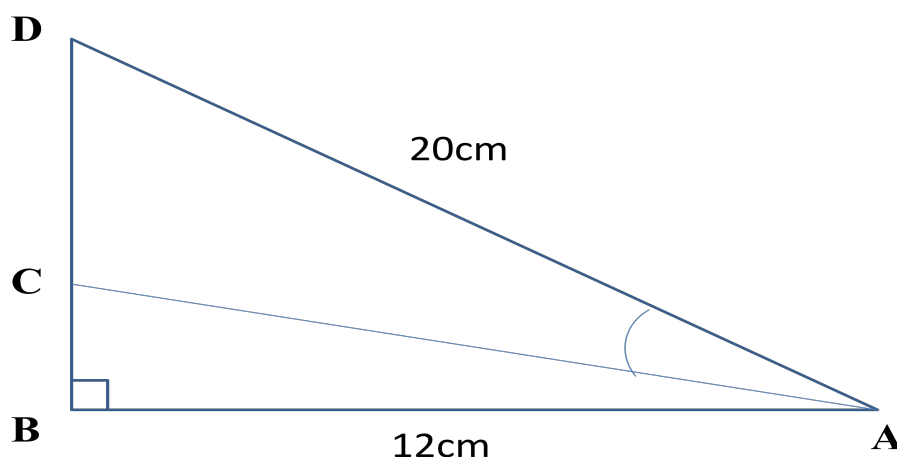
**$15.5 \div 4 = 3.875$ so 4 tins needed
 $4 \times 9 = 36$**

£..**36**.....(2)

(Total 6 marks)

Question 26

The diagram below shows a sail of a toy ship with a support mast AC. Angle ABD is 90° . Length AD is 20cm and AB is 12cm. The ratio of BC:CD is 1:3. Calculate the angle CAD to 1 decimal place.



$\sqrt{(20^2 - 12^2)} = \sqrt{256} = 16$ (length BD)
 $\cos BAD = 0.6$ $BAD = 53.1^\circ$
 $16 \div 4 = 4$ so length BC = 4cm (CD = 12cm using ratio 1:3)
 $\tan BAC = 0.33333$ $BAC = 18.4^\circ$
 angle CAD = $53.1 - 18.4 = 34.7^\circ$

..... **34.7°**m

(Total 5 marks)

Question 27

Here are the equations of four straight lines.

- Line K $y = 3x - 1$
- Line L $4y = 2x + 2$
- Line M $3x + 3y = 3$
- Line N $3x - y = -9$

Two of these lines are parallel.
 Write down the two parallel lines.

K and N in any order

Line**K**..... and Line.....**N**.....

(Total 1 mark)

Question 28

The densities of two different liquids P and Q are in the ratio 38 : 44

The mass of 1 cm³ of liquid Q is 1.1 g.

10 cm³ of liquid P is mixed with 30 cm³ of liquid Q to make 40 cm³ of liquid R.

Work out the density of liquid R.

$$\text{Density} = \frac{\text{mass}}{\text{volume}}, \quad \text{Mass} = \text{density} \times \text{volume}$$

For liquid Q:

$$\text{Density of Q} = \frac{1.1}{1} = 1.1 \text{ g/cm}^3$$

Mass of 30 cm³ of liquid Q will be $1.1 \times 30 = 33 \text{ g}$

For liquid P:

To work out the density of liquid P, we use the ratio given

$$\begin{array}{l} 38 : 44 \\ 0.95 : 1.1 \end{array} \begin{array}{l} \curvearrowright \\ \curvearrowleft \end{array} \div 44 \times 1.1$$

So density of P is 0.95 g/cm³

Mass of 10 cm³ of liquid P will be $0.95 \times 10 = 9.5 \text{ g}$

For liquid R:

$$\begin{aligned} \text{Mass of R} &= \text{Mass of P} + \text{Mass of Q} \\ &= 9.5 + 33 = 42.5\text{g} \end{aligned}$$

Volume is 40 cm³

Therefore the density of R will be $\frac{42.5}{40} = 1.0625$

1.0625

.....g/cm³

(Total 4 marks)

TOTAL FOR PAPER IS 80 MARKS