

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

Pearson Edexcel
Level 1/Level 2 GCSE (9–1)

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Thursday 8 November 2018

Morning (Time: 1 hour 30 minutes)

Paper Reference **1MA1/2F**

Mathematics

Paper 2 (Calculator)

Foundation Tier

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- You must **show all your working.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.



Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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6/7/17/17/1/

.CG Maths.
Worked Solutions


Pearson

Please note that these worked solutions have neither been provided nor approved by Pearson Education and may not necessarily constitute the only possible solutions. Please refer to the original mark schemes for full guidance.

Any writing in blue indicates what must be written in order to answer the questions and get the marks. The worked solutions have been designed to show the smallest amount of work which needs to be done to answer the question.

Anything written in green in a cloud doesn't have to be written in the exam.

Anything written in orange in a rectangle doesn't have to be written in the exam and is there to show what should be put into a calculator or measured using a ruler or protractor.

If you find any mistakes or have any requests or suggestions, please send an email to curtis@cgmaths.co.uk

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 Write down the value of the 4 in the number 542.3

The 4 is in the tens place

40

(Total for Question 1 is 1 mark)

- 2 Write down a square number that is also an odd number.

A number which is the result of multiplying a whole number by itself and which ends in a 1, 3, 5, 7 or 9

25

(Total for Question 2 is 1 mark)

- 3 (a) Change 4560 g into kg.

There are 1000g in 1kg so divide by 1000

4.56

(1)

kg

- (b) Change 7.3 m into mm.

There are 100cm in 1m and 10mm in 1cm so multiply by 100 then by 10

7300

(1)

mm

(Total for Question 3 is 2 marks)

- 4 Work out the cube root of 64

Type into the calculator

4

(Total for Question 4 is 1 mark)

- 5 Write 0.31 as a fraction.

Type into the calculator

$\frac{31}{100}$

(Total for Question 5 is 1 mark)

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6 Here are four fractions.

$$\frac{3}{4} \quad \frac{5}{7} \quad \frac{19}{25} \quad \frac{11}{15}$$

0.75 0.71... 0.76 0.73

Write the fractions in order of size.
Start with the smallest fraction.

First convert them to decimals. To compare the decimals, compare the hundredths as the units and tenths are the same

$$\frac{5}{7}, \frac{11}{15}, \frac{3}{4}, \frac{19}{25}$$

(Total for Question 6 is 2 marks)

7 (a) Simplify $3m - m - m + 3m$

$$\begin{aligned} 3 - 1 &= 2 \\ 2 - 1 &= 1 \\ 1 + 3 &= 4 \end{aligned}$$

$$4m$$

(1)

(b) Simplify $2 \times n \times p \times 4$

$$\begin{aligned} \text{Multiply in any order.} \\ 2 \times 4 &= 8 \\ 8 \times n \times p &= 8np \end{aligned}$$

$$8np$$

(1)

(Total for Question 7 is 2 marks)

8 A map has a scale of 1 cm to 14 km.

On the map, the distance between Manchester and London is 18.8 cm.

What is the real distance, in km, between Manchester and London?

$$18.8 \times 14$$

Every cm is 14km

$$263.2 \text{ km}$$

(Total for Question 8 is 2 marks)

- 9 (a) The n th term of a sequence is $3n + 4$

Explain why 21 is not a term of this sequence.

$$3n + 4 = 21 \quad 3n = 17 \quad n = \frac{17}{3} \quad n \text{ needs to be a whole number}$$

(2)

- (b) Here are the first three terms of a different sequence.

1 2 4

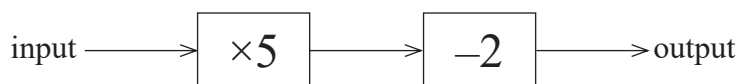
Write down two numbers that could be the 4th term and the 5th term of this sequence.
Give the rule you have used to get your numbers.

$$8, 16 \quad \text{double the previous term}$$

(2)

(Total for Question 9 is 4 marks)

- 10 Here is a number machine.



- (a) Work out the **output** when the input is 8

$$8 \times 5 = 40$$

$$40 - 2$$

38

(1)

- (b) Work out the **input** when the output is 28

$$28 + 2 = 30$$

$$30 \div 5$$

Start with the output then follow the instructions in the opposite order and with the opposite operations

6

(2)

(Total for Question 10 is 3 marks)

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- 11 Adam gets a bonus of 30% of £80
Katy gets a bonus of £28

Work out the difference between the bonus Adam gets and the bonus Katy gets.

$$0.3 \times 80 = 24$$

30 ÷ 100 = 0.3, this is 30% as a decimal

$$28 - 24$$

Difference is largest subtract smallest

£ 4

(Total for Question 11 is 3 marks)

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- 12 There are 49 counters in a bag.

20 of the counters are red.
The rest of the counters are blue.

One of the counters is taken at random.

Find the probability that the counter is blue.

$$49 - 20 = 29$$

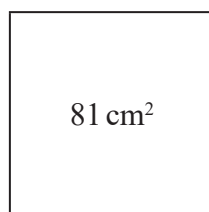
29 out of the 49 counters are blue

$$\frac{29}{49}$$

(Total for Question 12 is 2 marks)

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13 A square has an area of 81 cm^2



(a) Find the perimeter of the square.

$$\sqrt{81} = 9$$

$$9 \times 4$$

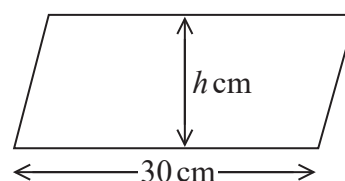
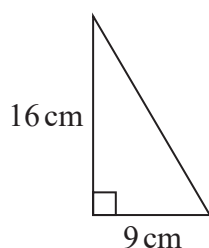
Length squared finds the area of a square so the square root of the area finds the side length

Each side is 9cm and there are 4 sides. Perimeter is the total length of all of the sides

36

(2)

The diagram shows a right-angled triangle and a parallelogram.



The area of the parallelogram is 5 times the area of the triangle.
The perpendicular height of the parallelogram is h cm.

(b) Find the value of h .

$$\frac{1}{2} \times 9 \times 16 = 72$$

$$72 \times 5 = 360$$

$$30 \times h = 360$$

$$h = \frac{360}{30}$$

$\frac{1}{2} \times \text{base} \times \text{height} = \text{area of a triangle}$

The area of the parallelogram is 5 times the area of the triangle

Base \times height = area of a parallelogram

Rearranging to find the height

$$h = \dots\dots\dots 12$$

(3)

(Total for Question 13 is 5 marks)

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14 Victoria throws an ordinary fair 6-sided dice once.

She says,

“The probability of getting a 3 is half the probability of getting a 6”

(a) Is Victoria correct?

You must explain your answer.

No as the probability of both is 1/6

1 out of the 6 faces is a 3 and
1 out of the 6 faces is a 6

(1)

Andy throws the dice twice.

He says,

“The probability of getting a 6 on both throws is $\frac{2}{6}$ ”

(b) Is Andy correct?

You must explain your answer.

No as the probability is 1/36

Multiplying the probabilities works
out the probability of both happening.
 $1/6 \times 1/6 = 1/36$

(1)

Indre throws the dice once.

She also throws a coin to get Heads or Tails.

(c) List all the possible outcomes she can get.

H1, H2, H3, H4, H5, H6, T1, T2, T3, T4, T5, T6

(2)

(Total for Question 14 is 4 marks)

- 15 Remi invests £600 for 5 years in a savings account.
By the end of the 5 years he has received a total of £75 simple interest.

Work out the annual rate of simple interest.

$$75 \div 5 = 15$$

It is simple interest so the interest is the same each year. This works out the interest received in one year

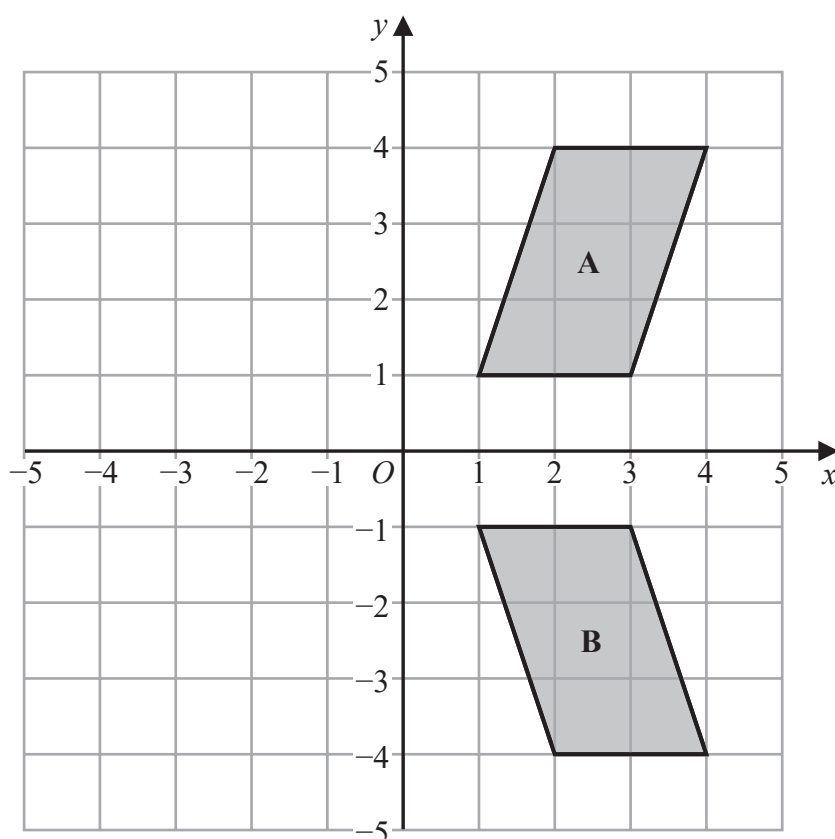
$$\frac{15}{600} \times 100$$

Writing the interest received in one year as a fraction of the amount invested then multiplying by 100 to convert into a percentage

..... 2.5 %

(Total for Question 15 is 3 marks)

16



Describe fully the single transformation that maps shape A onto shape B.

Reflection in the x axis

(Total for Question 16 is 2 marks)

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17 Adrian is going to make concrete.
He is going to use

- 180 kg of cement
- 375 kg of sand
- 1080 kg of stone

Cement, sand and stone are sold in bags.

1 bag cement	1 bag sand	1 bag stone
25 kg	22.5 kg	50 kg

Adrian already has

- 10 bags of cement
- 20 bags of sand
- 20 bags of stone

Work out what bags he needs to buy to make the concrete.

$10 \times 25 = 250$

10 bags of cement contains 250kg. This is over 180kg so he doesn't need to buy any more cement

$20 \times 22.5 = 450$

20 bags of sand contains 450kg. This is over 375kg so he doesn't need to buy any more sand

$20 \times 50 = 1000$

20 bags of stone contains 1000kg. This is less than 1080kg so he needs to buy more stone

$1080 - 1000 = 80$

He needs 80kg more

$80 \div 50 = 1.6$

This works out how many lots of 50kg bags he needs to buy

2 bags of stone

Bags need to be bought in whole numbers so we round up 1.6 to 2

(Total for Question 17 is 3 marks)

- 18 Bill wants to increase 150 by 3%
He writes down

$$150 \times 1.3 = 195$$

Bill's method is wrong.

- (a) Explain why.

He is increasing by 30%

1.3 x 100 = 130% so it is an increase of 30%

(1)

Sally wants to decrease 150 by 3%

- (b) Complete this statement to show how Sally can decrease 150 by 3%

100% - 3% = 97%
97/100 = 0.97

$$150 \times 0.97 = 145.5$$

(1)

(Total for Question 18 is 2 marks)

- 19 (a) Solve $3(x - 4) = 12$

$$x - 4 = 4$$

To rearrange an equation, follow BIDMAS backwards. Multiplication needs to be dealt with first. Divide both sides by 3 to eliminate the multiplication by 3

Add 4 to both sides to eliminate the -4

$$x = 8$$

(2)

- (b) Factorise fully $9b - 3b^2$

3b is a common factor of both terms

$$3b(3 - b)$$

(2)

(Total for Question 19 is 4 marks)

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20 $\mathcal{E} = \{\text{even numbers between 1 and 25}\}$

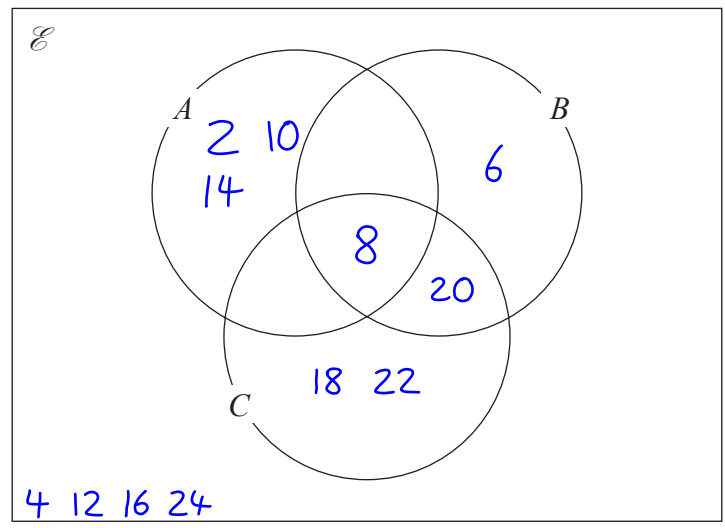
$A = \{2, 8, 10, 14\}$

$B = \{6, 8, 20\}$

$C = \{8, 18, 20, 22\}$

8 is in A, B and C. 20 is in B and C

(a) Complete the Venn diagram for this information.



(4)

A number is chosen at random from \mathcal{E} .

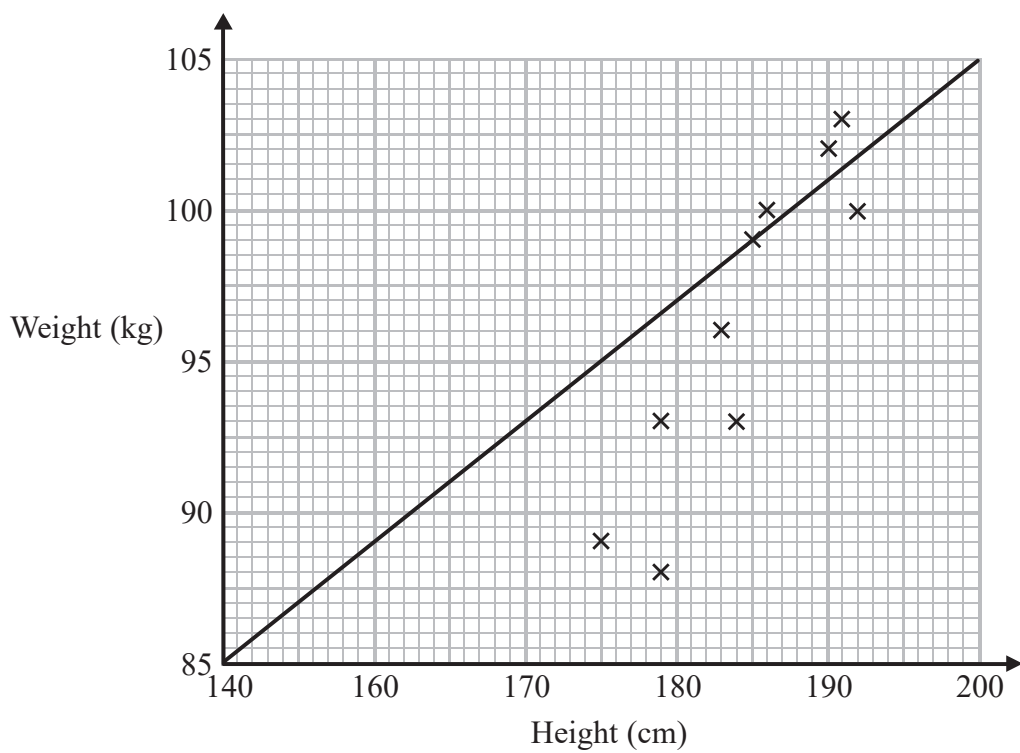
(b) Find the probability that the number is a member of $A \cap B$.

1 out of the 12 numbers is in A and B

$\frac{1}{12}$
(2)

(Total for Question 20 is 6 marks)

21 Sean has information about the height, in cm, and the weight, in kg, of each of ten rugby players. He is asked to draw a scatter graph and a line of best fit for this information. Here is his answer.



Sean has plotted the points accurately.

Write down two things that are wrong with his answer.

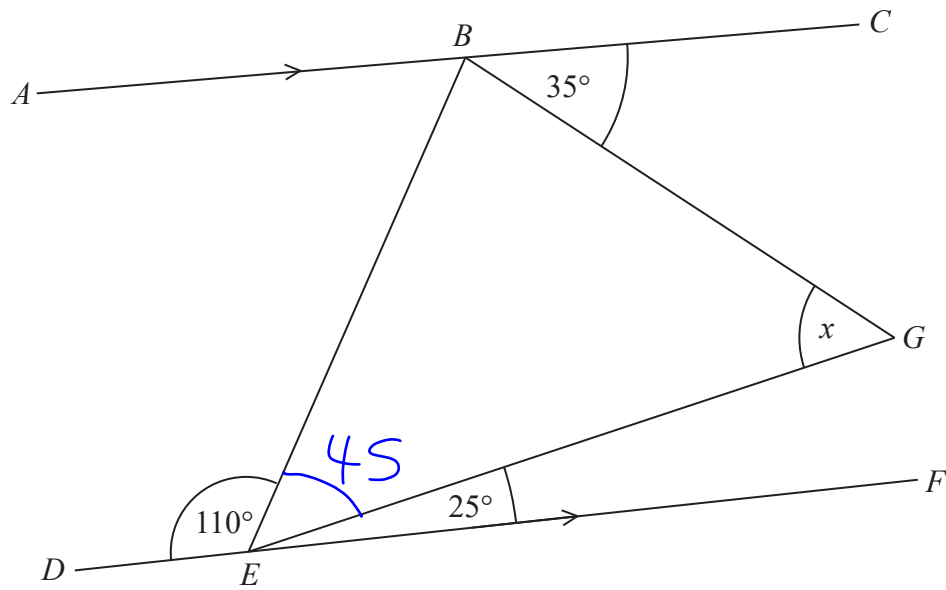
1 The line of best fit is wrong

It doesn't fit the correlation and has been forced through the origin

2 150 is missing on the x axis

(Total for Question 21 is 2 marks)

22 BEG is a triangle.



ABC and DEF are parallel lines.

Work out the size of angle x .

Give a reason for each stage of your working.

$$180 - 110 - 25 = 45$$

Angle BEG is 45° as angles on a straight line add to 180°

Angle EBC is 110° as it is an alternate angle to DEB

$$110 - 35 = 75$$

Angle EBG is 75°

$$180 - 45 - 75 = 60$$

x is 60° as angles in a triangle add to 180°

..... 60 °

(Total for Question 22 is 4 marks)

- 23 Northern Bank has two types of account.
Both accounts pay compound interest.

Cash savings account
Interest
2.5% per annum

Shares account
Interest
3.5% per annum

Ali invests £2000 in the cash savings account.
Ben invests £1600 in the shares account.

- (a) Work out who will get the most interest by the end of 3 years.
You must show all your working.

$$100\% + 2.5\% = 102.5\%$$

$$102.5/100 = 1.025$$

$$2000 \times 1.025^3 = \pounds 2153.78$$

This calculates the amount of money Ali will have in 3 years

$$2153.78 - 2000 = \pounds 153.78$$

Subtracting the original amount works out how much interest Ali gets

$$100\% + 3.5\% = 103.5\%$$

$$103.5/100 = 1.035$$

$$1600 \times 1.035^3 = \pounds 1773.95$$

This calculates the amount of money Ben will have in 3 years

$$1773.95 - 1600 = \pounds 173.95$$

Subtracting the original amount works out how much interest Ben gets

Ben ← Ben got more interest than Ali

(4)

In the 3rd year the rate of interest for the shares account is changed to 4% per annum.

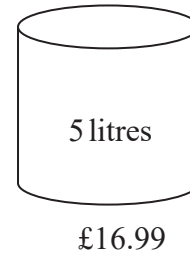
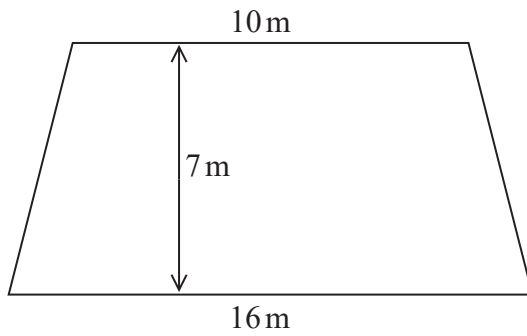
- (b) Does this affect who will get the most interest by the end of 3 years?
Give a reason for your answer.

No as Ben will get even more interest

(1)

(Total for Question 23 is 5 marks)

24 The diagram shows a floor in the shape of a trapezium.



John is going to paint the floor.

Each 5 litre tin of paint costs £16.99
1 litre of paint covers an area of 2 m^2

John has £160 to spend on paint.

Has John got enough money to buy all the paint he needs?
You must show how you get your answer.

$$\frac{1}{2}(10+16) \times 7 = 91$$

$\frac{1}{2} \times (a + b) \times h = \text{area of trapezium}$
This works out the area of the floor

$$91 \div 2 = 45.5$$

This works out how many litres of paint are needed

$$45.5 \div 5 = 9.1$$

This works out how many tins of paint are needed

$$10 \times \pounds 16.99 = \pounds 169.90$$

This works out the cost of the paint needed

The number of tins is rounded up to 10 as there needs to be a whole number of tins and 9 isn't enough

No

£169.90 is more than the £160 he has to spend

(Total for Question 24 is 5 marks)

- 25 A is the point with coordinates $(5, 9)$
 B is the point with coordinates $(d, 15)$

The gradient of the line AB is 3

Work out the value of d .

$$\frac{15-9}{d-5} = 3$$

Change in y over change in x works out the gradient

$$15-9 = 3d-15$$

Rearranging to find d

$$21 = 3d$$

7

(Total for Question 25 is 3 marks)

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26 (a) Expand and simplify $(5x + 2)(2x - 3)$

$10x^2 - 15x + 4x - 6$

$5x \times 2x = 10x^2$
 $5x \times -3 = -15x$
 $2 \times 2x = 4x$
 $2 \times -3 = -6$

$-15x + 4x = -11x$

$10x^2 - 11x - 6$

(2)

(b) Factorise $x^2 + 4x + 3$

What two numbers multiply to 3 and add to 4? 3 and 1

$(x + 3)(x + 1)$

(2)

(Total for Question 26 is 4 marks)

27 (a) Write the number 0.00007547 in standard form.

Multiply by ten 5 times to get a number between 1 and 10 so multiply by 10^{-5} to make up for this

7.547×10^{-5}

(1)

(b) Write 3.42×10^4 as an ordinary number.

3.4200

Multiply by ten 4 times

34200

(1)

(c) Work out $\frac{2.3 \times 10^4 \times 6.7 \times 10^3}{5 \times 10^{-8}}$

Type into calculator

3.082×10^{15}

(2)

(Total for Question 27 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS