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)

Time 1 hour 30 minutes

Paper reference **1MA1/3F**

Mathematics

PAPER 3 (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.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

P64633A

E:1/1/1/1/1/1/1/1/

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

.CG Maths.

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write 45% as a decimal.

45/100

Percentages are out of 100 so dividing by 100 converts it into a decimal

0.45

(Total for Question 1 is 1 mark)

2 Write down two factors of 35

1 x 35 = 35 so 1 and 35 are both factors of 35

1, 35

(Total for Question 2 is 1 mark)

3 What is the time 2 hours 40 minutes after 8.05 am?

8°5° + 2°40° = 10°45'0"
Time can be entered into the calculator using the °'" button

10.45 am

(Total for Question 3 is 1 mark)

4 Work out $\frac{1}{6}$ of 66

1/6 x 66

Of means to multiply

11

(Total for Question 4 is 1 mark)

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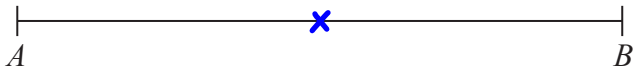
5 AB is a straight line.

Mark with a cross (×) the midpoint of AB.



(Total for Question 5 is 1 mark)

6 (a) Simplify $a \times b \times 4$

4ab

(1)

(b) Simplify $4x + 3 - x + 5$

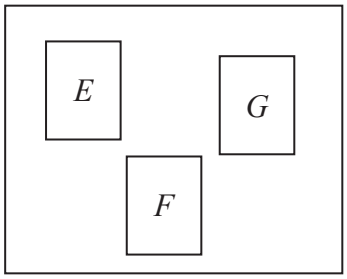
Collecting the like terms. 4x - x = 3x. 3 + 5 = 8

3x+8

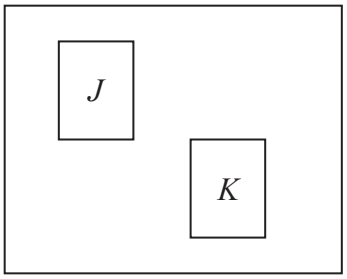
(2)

(Total for Question 6 is 3 marks)

7 There are three cards in bag **A** and two cards in bag **B**.
There is a letter on each card.



Bag **A**



Bag **B**

James takes a card from bag **A** and then a card from bag **B**.

List all the possible outcomes.

EJ, EK, GJ, GK, FJ, FK

Using systematic listing

(Total for Question 7 is 2 marks)

8 On Monday, Sandy pays for 2 plane tickets, 7 nights in a hotel and 2 theme park tickets.

	dollars
each plane ticket	600
each night in a hotel	120
each theme park ticket	250

Show that Sandy pays more than 2500 dollars on Monday.

$2\times600+7\times120+2\times250=2540$

Adding together all of the costs shows that it costs $2540, which is more than $2500

Cost of 2 plane tickets

Cost of 7 nights in a hotel

Cost of 2 theme park tickets

(Total for Question 8 is 3 marks)

9 Vadim has 56 clocks.
The clocks are only red, only blue or only black.

32 of the clocks are plastic.
5 of the 14 blue clocks are plastic.
8 of the 12 red clocks are **not** plastic.

Use this information to complete the two-way table.

	Red	Blue	Black	Total
Plastic	4	5	23	32
Not plastic	8	9	7	24
Total	12	14	30	56

(Total for Question 9 is 3 marks)

10 Corina has £300 to spend on books.
Each book costs £4.85

Work out the greatest number of books Corina can buy.

$\frac{300}{4.85}$ ← Dividing the amount of money she has by the cost of each book works out how many lots of the £4.85 go into the £300

The answer of 61.8... is rounded down as there cannot be a decimal number of books and she cannot afford 62 books → 61

(Total for Question 10 is 3 marks)

11 (a) Write 196 minutes in hours and minutes.

0°196° = 3°16'0"
Time can be entered into the calculator using the ▭ button

..... 3 ..... hours ..... 16 ..... minutes

(2)

A train travels x miles in 2 hours.

(b) Write down an expression, in terms of x, for the average speed of the train.

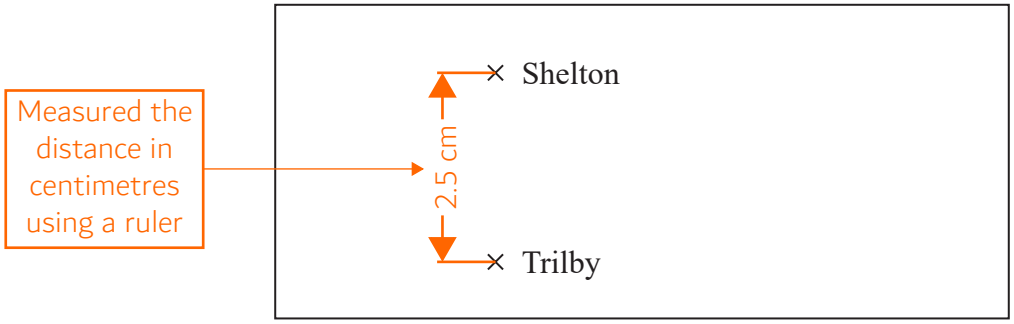
The unit of miles per hour mean that the distance in miles needs to be divided by the time in hours

..... $\frac{x}{2}$ ..... miles per hour

(1)

(Total for Question 11 is 3 marks)

12 The diagram shows two places on a map.



Scale: 1 centimetre represents 20 kilometres

(a) What is the actual distance, in kilometres, from Shelton to Trilby?

2.5X20 ← There are 2.5 centimetres so the actual distance must be 2.5 lots of 20 kilometres

50 kilometres

(2)

On a scale drawing, the scale is given as 1 : 1200

(b) How many metres does 5 centimetres represent on this drawing?

5X1200 / 100 ← 1200 is 1200 times greater than 1. So the actual length is 1200 times greater than 5 centimetres. There are 100 centimetres in a metre so dividing by 100 converts it into metres

60 metres

(2)

(Total for Question 12 is 4 marks)

13 In the Northern hemisphere the ratio of the area of land to the area of water is 2 : 3

(a) Work out what percentage of the area of the Northern hemisphere is land.

$\frac{2}{2+3} \times 100$ ← 2 + 3 works out how many parts there are in total in the ratio. 2 out of these are for land. Expressing this as a fraction then multiplying it by 100 to convert it into a percentage

40 %

(2)

20% of the area of the Southern hemisphere is land.

(b) Work out the ratio of the area of land to the area of water in the Southern hemisphere.

100 − 20 ← Percentage is out of 100 so this works out the percentage for water

There is 20% land and 80% water. This can be written in a ratio and does not need to be simplified → 20 : 80

(2)

(Total for Question 13 is 4 marks)

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14 A stadium cost £600 million.

$\frac{13}{15}$ of this cost was for the building.

The rest of the cost was for the land.

Work out the cost of the land.

$600 - \frac{13}{15} \times 600$

'Of' means to multiply so multiplying the fraction by the total cost works out the cost for the building. Subtracting this from the total cost leaves the cost for the land. As the answer is given in millions, there is no need to work with the millions so 600 can be used instead of 600 million

£ 80 million

(Total for Question 14 is 3 marks)

15 Jenna measures all the angles around a point.

Her results are 23°, 145°, 23° and 69°

23 + 145 + 23 + 69 = 260

Explain why these results cannot be true.

They do not add to 360

There are 360° around a point

(Total for Question 15 is 1 mark)

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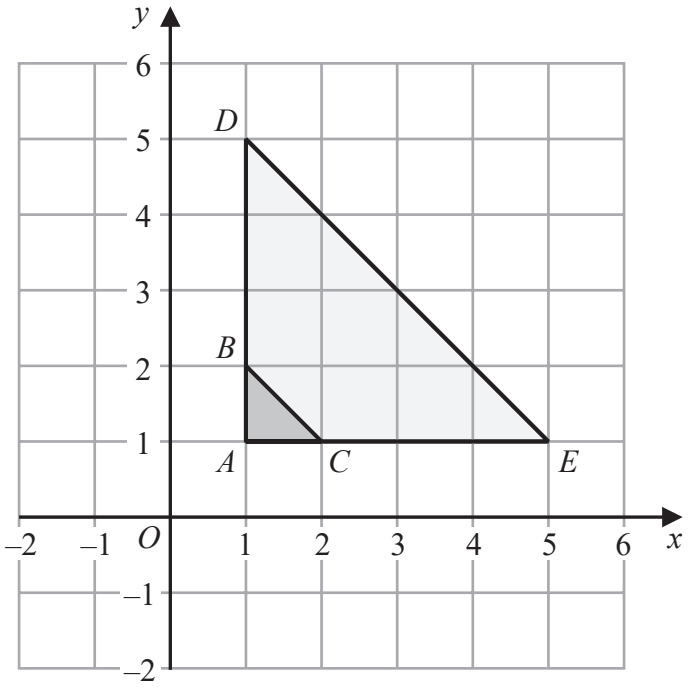
16 Here is a diagram showing triangle *ABC* and triangle *ADE*.



Describe fully the single transformation that maps triangle *ABC* onto triangle *ADE*.

Enlargement, scale factor 4, centre (1 , 1)

It is an enlargement as it has changed size. The scale factor is 4 as all of the sides have been multiplied by 4. The centre is (1 , 1) as all of the points on the triangle move away from this point

(Total for Question 16 is 2 marks)

17 (a) Expand $y(y + 5)$

y^2+5y

(1)

(b) Factorise $4a - 6$

2 is the highest common factor of both terms so bringing this out as a factor by dividing both terms by it and leaving the result in a bracket

$2(2a-3)$

(1)

(c) Solve $2(5x - 4) = 21$

$5x-4=\frac{21}{2}$ ← Dividing both sides by 2

$5x=\frac{21}{2}+4$ ← Adding 4 to both sides

$x=\frac{\frac{21}{2}+4}{5}$ ← Dividing both sides by 5

$x =$ 2.9

(3)

(d) Simplify $4e^2f \times 5ef^3$

The multiplication can be done in any order. 4 x 5 = 20. e^2 x e = e^3. f x f^3 = f^4

$20e^3f^4$

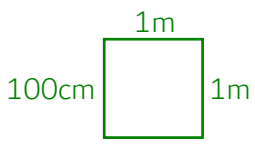
(2)

(Total for Question 17 is 7 marks)

18 Change 1 m^2 into cm^2

1×100^2 ← There are 100cm in 1m. So multiplying by 100 converts metres to centimetres, however the unit is squared so it should be multiplied by 100^2

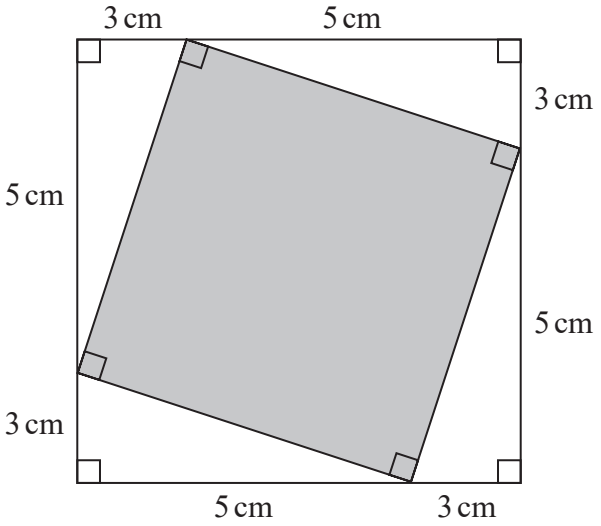
Alternatively, consider a square which has an area of 1m^2. Converting the lengths into centimetres and finding out its area in cm^2 will be 100 x 100



10000 cm^2

(Total for Question 18 is 1 mark)

19 This diagram shows two squares.



Work out the area of the square shown shaded in the diagram.

$(5+3)^2 - 4(\frac{1}{2} \times 5 \times 3)$

Subtracting the area of the 4 triangles from the area of the larger square leaves the area of the shaded square

5 + 3 works out the length of the larger square. Area of square = length^2

The area of the 4 white triangles. Area of triangle = 1/2 x base x height

Area is measured in squares so the unit is cm^2

34cm^2

(Total for Question 19 is 4 marks)

20 Here are the heights, in centimetres, of 15 plants.

15	20	25	33	17	22	25	18
22	19	32	35	24	28	19	

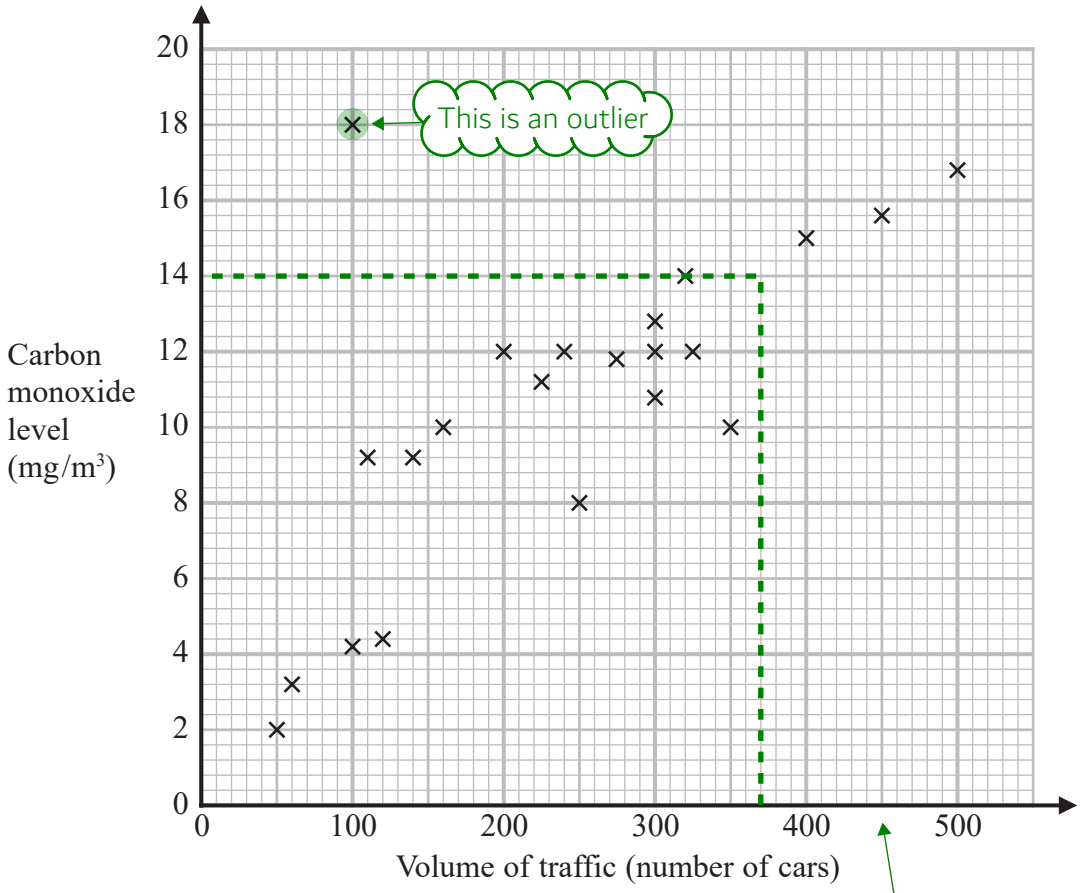
Draw a stem and leaf diagram for these heights.

1	57899
2	0224558
3	235

Key: 1 \| 5 = 15

(Total for Question 20 is 3 marks)

21 The scatter graph shows information about the volume of traffic and the carbon monoxide level at a point on a road each day for 22 days.



The scale goes up 100 over 10 small boxes. 100/10 = 10 so each small box is worth 10

One point is an outlier.

(a) Write down the coordinates of this point.

(100 , 18)

(1)

For another day, 370 cars pass the point on the road.

(b) Estimate the carbon monoxide level for this day.

Reading up to a point on the graph which is about in the middle of the surrounding data then reading across. There is no need to draw a line of best fit and this can actually make it more difficult to make an estimate

14 mg/m³

(2)

Alfie says,

"Because there is an outlier, there is no correlation."

(c) Is Alfie correct?
You must give a reason for your answer.

No, this point can be ignored

(1)

(Total for Question 21 is 4 marks)

22 Natalie makes potato cakes in a restaurant.

She mixes potato, cheese and onion so that

weight of potato : weight of cheese : weight of onion = 9 : 2 : 1

Natalie needs to make 6000 g of potato cakes.

Cheese costs £2.25 for 175 g.

Work out the cost of the cheese needed to make 6000 g of potato cakes.

$\frac{6000}{9+2+1} \times 2 \times 2.25$

9 + 2 + 1 works out how many parts there are in total. This number of parts represents the total 6000g. So dividing the 6000 by this many parts works out what 1 part of the ratio is worth. Multiplying this by 2 works out what the 2 parts representing the cheese is worth. Dividing this by 175 works out how many lots of 175g the cheese is. Multiplying this by £2.25 works out the cost of this many lots of the cheese

The answer of 12.857... is rounded to the nearest penny

£ 12.86

(Total for Question 22 is 4 marks)

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23 (a) Write 4.5×10^5 as an ordinary number.

Type into calculator

450000

(1)

(b) Write 0.007 in standard form.

Type into calculator

7×10^{-3}

(1)

(c) Work out $4.2 \times 10^3 + 5.3 \times 10^2$
Give your answer in standard form.

Typing into calculator gives 4730

Standard form is a x 10^n, where $1 \leq a < 10$ and n is an integer. Keep dividing 4730 by 10 until it is a number between 1 and 10 then multiply it by a power of 10 which multiplies by 10 that many times. x10^y multiplies by 10 y times

4.73×10^3

(2)

(Total for Question 23 is 4 marks)

24 A water tank is empty.
Anil needs to fill the tank with 2400 litres of water.

Company **A** supplies water at a rate of 8 litres in 1 minute 40 seconds.
Company **B** supplies water at a rate of 2.2 gallons per minute.

1 gallon = 4.54 litres

Company **A** would take more time to fill the tank than Company **B** would take to fill the tank.

How much more time?
Give your answer in minutes correct to the nearest minute.

$\frac{2400}{8} \times 1:40 - \frac{2400}{2.2 \times 4.54}$

Subtracting the time for Company B from the time for Company A works out how many more minutes it takes

This works out the time in minutes for Company A. 2400/8 works out how many lots of the 8 litres are needed. Then multiplying this by the time taken per lot of 8 litres works out the total time taken

This works out the time in minutes for Company B. 2.2 x 4.54 converts the gallons into litres. Dividing the 2400 by this works out how many lots of that many litres it is and therefore how many minutes it takes

1°40°
Time can be entered into the calculator using the ⁰'" button

260 minutes

(Total for Question 24 is 4 marks)

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25 The first four terms of a Fibonacci sequence are

$$a \qquad 2a \qquad 3a \qquad 5a$$

The sum of the first five terms of this sequence is 228

Work out the value of a.

$a+2a+3a+5a+8a$ ← Adding together the first five terms. The fifth term is 8a as 3a + 5a = 8a. In a Fibonacci sequence, the two previous terms are added to get the next term

$19a=228$ ← Simplifying the expression of the sum of the first five terms and setting it equal to 228

Dividing both sides by 19 finds a → 12

(Total for Question 25 is 3 marks)

26 In a bag there are only red counters, blue counters, green counters and pink counters.
A counter is going to be taken at random from the bag.

The table shows the probabilities of taking a red counter or a blue counter.

Colour	red	blue	green	pink
Probability	0.05	0.15	0.5	0.3

The probability of taking a green counter is 0.2 more than the probability of taking a pink counter.

(a) Complete the table.

$p + p + 0.2 = 1 - 0.05 - 0.15$

$2p = 0.8 - 0.2$

$p = \frac{0.6}{2}$

$0.3 + 0.2$

p is the probability for pink. p + 0.2 must be the probability for green. Subtracting the probabilities for red and blue from 1 leaves the total probability for green and pink added together

The probability for pink is 0.3. Adding 0.2 works out the probability for green

(2)

There are 18 blue counters in the bag.

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

$x \times 0.15 = 18$

x is the total number of counters. Multiplying this by the probability of blue expresses the number of blue counters, which is 18

$x = \frac{18}{0.15}$

Rearranged to find x by dividing both sides by 0.15

120

(2)

(Total for Question 26 is 4 marks)

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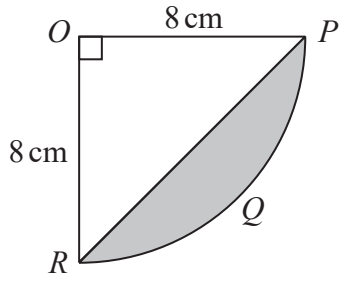
27 The diagram shows a sector $OPQR$ of a circle, centre O and radius 8 cm.



OPR is a triangle.

Work out the area of the shaded segment PQR.
Give your answer correct to 3 significant figures.

$\frac{\pi \times 8^2}{4} - \frac{1}{2} \times 8 \times 8$

Subtracting the area of the triangle from the sector leaves the shaded segment

Area of the sector OPQR. Area of circle = π x radius^2. The radius is 8cm. Dividing the area of the whole circle by 4 as it is a quarter of the circle

Area of the triangle OPR. Area of triangle = 1/2 x base x height. The base and height are both 8cm

The answer of 18.265... is rounded to 3 significant figures

18.3 cm^2

(Total for Question 27 is 4 marks)

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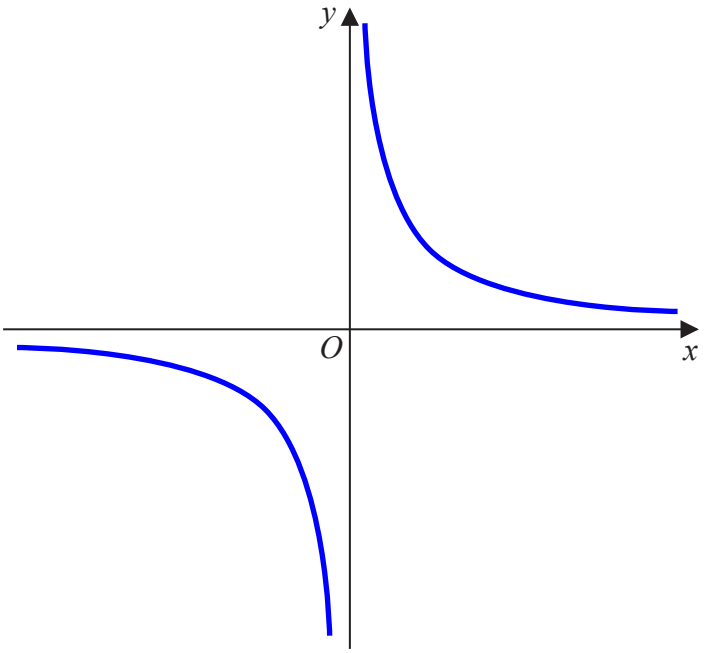
28 Sketch the graph of $y = \frac{1}{x}$

Using table mode to get a table of values. Set f(x) = 1/x. Table range, Start: -5, End: 5, Step: 1



(Total for Question 28 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS