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# Edexcel Level 1/Level 2 . GCSE (9-1)

**Time:** 1 hour 30 minutes

Paper reference **PA-1MA1/1H**

# Mathematics - SET 1

## Paper 1 (Non-Calculator)

## Higher Tier



**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.
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 not be used.**

## 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.

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Turn over

**Answer ALL questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

**1** The cost of an iPhone in three different countries is shown below.

| Country | Cost |
|---|---|
| England | £780 |
| USA | $975 |
| Germany | €910 |

The exchange rates are

£1= $1.5
£1= €1.3

In which country does the iPhone cost the least?
You must show your working.

.....

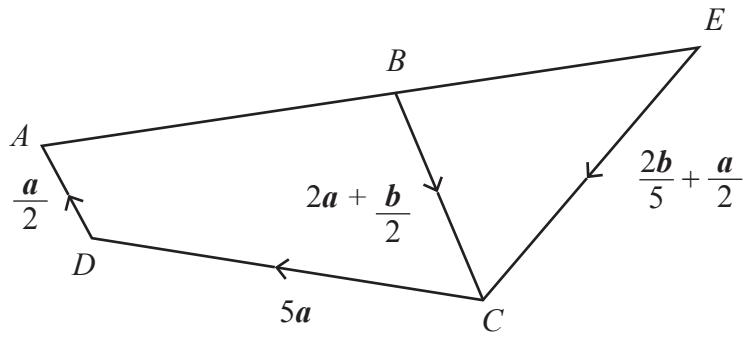
**(3)**

**(Total for Question 1 is 3 marks)**

**2** Prove that the sum of any three consecutive integers is divisible by 3.

**(Total for Question 2 is 3 marks)**

**3** For the diagram given below,




(a) Find vector $\overrightarrow{BE}$ in terms of $\boldsymbol{a}$ and $\boldsymbol{b}$.

.....

**(1)**

(b) Show that $ABE$ is a straight line.

**(3)**

**(Total for Question 3 is 4 marks)**

**4** The sum of all the sides of a right angled triangle is 192 cm.
The lengths of its sides are in the ratio 6 : 8 : 10.

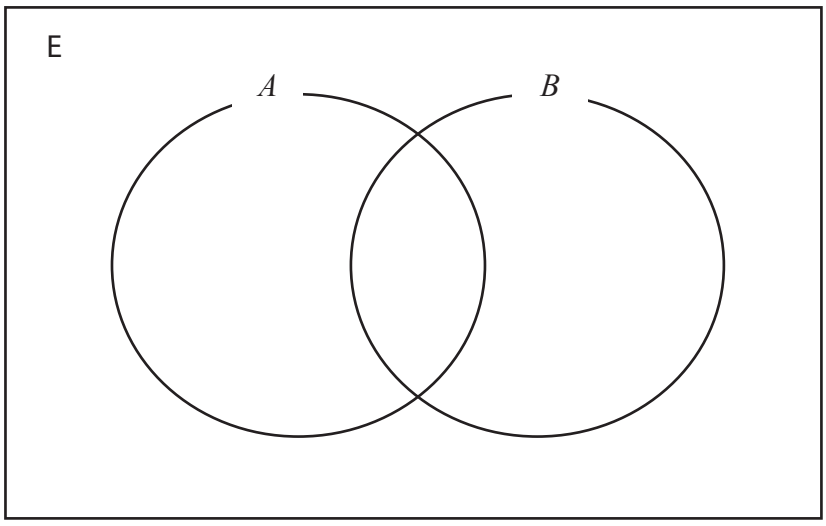
Work out the area of the triangle.

..... $cm^2$

**(Total for Question 4 is 4 marks)**

---

**5** E = {prime numbers between 1 and 50}
A = {3, 11, 17, 23, 31, 41, 47}
B = {2, 7, 11, 13, 23, 29, 37, 41, 43}




(a) Complete the Venn diagram to represent this information.

**(4)**

A number is chosen at random from the universal set E.

(b) What is the probability that the number is in the set $A \cap B$?

.....

**(2)**

**(Total for Question 5 is 6 marks)**

---

**6** Find the mean and range for the following data.

51 70 25 8 18 2 42 12 33

Mean = .....

**(1)**

Range = .....

**(1)**

**(Total for Question 6 is 2 marks)**

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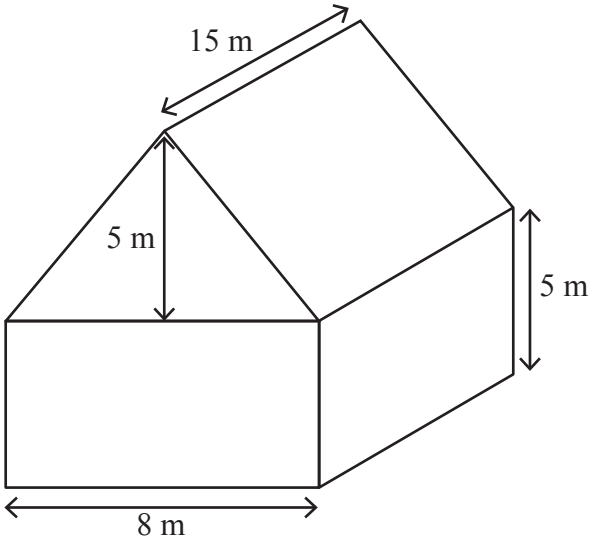
**7** Convert $\frac{22}{36}$ to a recurring decimal.

.....

**(Total for Question 7 is 2 marks)**

---

**8** Jacob builds a house from a cuboid and a triangular prism as shown below.




Work out the total volume of the house.

..... $m^3$

**(Total for Question 8 is 4 marks)**

**9** Solve the simultaneous equations.

$$4x + y = 12$$
$$5x - 3y = 32$$

$x =$ .....

$y =$ .....

**(Total for Question 9 is 3 marks)**

**10** If $f(x) = (x - 1)^2$ and $g(x) = 3(x + 3)$

Find

(a) $gf(x)$

.....

**(2)**

(b) $fg(-3)$

.....

**(2)**

**(Total for Question 10 is 4 marks)**

**11** Deo needs 150 g of butter to make 1 kg of cake.

She also needs

two times as much flour as butter.
three times as much sugar as butter.

Deo is going to make 3 kg cake.

(a) Work out the amount of sugar she needs.

..... kg

**(3)**

Deo has to buy all the flour she needs to make 3 kg cake.
If she buys the flour in 100 g packs.

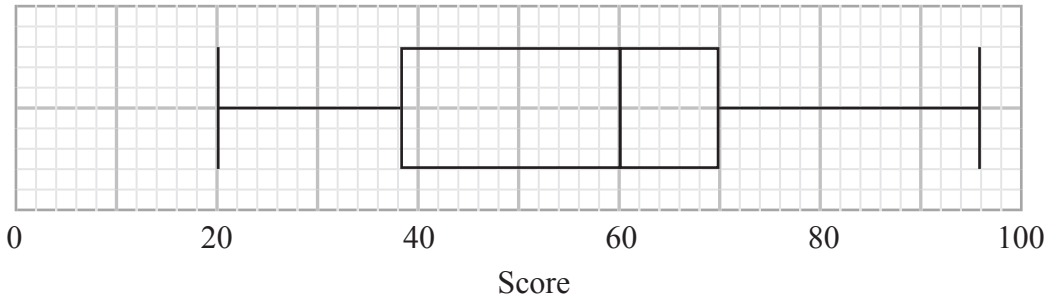
(b) How many packs of flour does she need?

.....

**(2)**

**(Total for Question 11 is 5 marks)**

**12** Mrs Smith sets her class a quiz, which has a maximum score of 100. The distribution of the scores are shown in a box plot below.




(a) Write down the median score.

.....

**(1)**

(b) Find the interquartile range.

.....

**(2)**

Lewis scored 70 marks.

(c) What percentage of the class scored marks lesser than Lewis?

..... %

**(1)**

(d) The interquartile range is a better measure of the spread of a distribution than the range. Explain why.

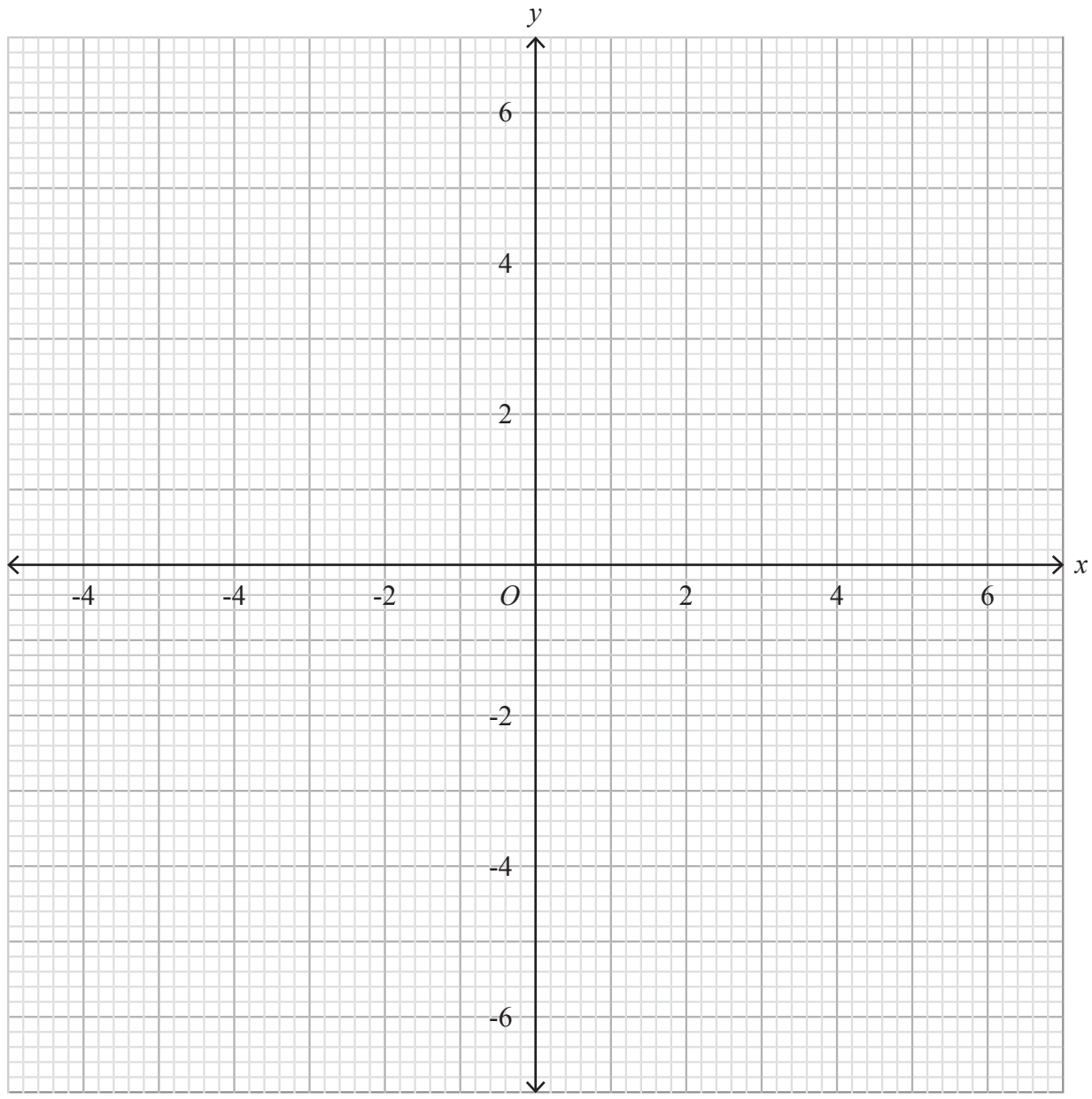
.....

.....

**(1)**

**(Total for Question 12 is 5 marks)**

**13** (a) On the grid, draw the graph of $x^2 + y^2 = 6.25$




**(2)**

(b) Hence find estimates for the solutions of the simultaneous equations

$$x^2 + y^2 = 6.25$$
$$2y + x = 2$$

.....

**(3)**

**(Total for Question 13 is 5 marks)**

**14** Suzie has 20 books.

Each book is different from the others.

She gives away one book to Alex and one book to Betty.

(a) In how many ways can Suzie do this?

.....

**(2)**

There are 5 boys and 9 girls in an arts class.
Adam is going to make a team of two students for a competition.
He selects two students and writes down the names in a list in order.

| | | | |
|---|---|---|---|
| Boy<br>Boy | OR | Girl<br>Girl | |

(b) How many different lists can Adam make for a team of two students?

.....

**(3)**

**(Total for Question 14 is 5 marks)**

**15** A shop sells packs of white candles, red candles and green candles.

There are
3 candles in each pack of white candles.
6 candles in each pack of red candles.
10 candles in each pack of green candles.

On Saturday,

$$\text{Number of packs of white candles sold} : \text{Number of packs of red candles sold} : \text{Number of packs of green candles sold} = 6 : 4 : 2$$

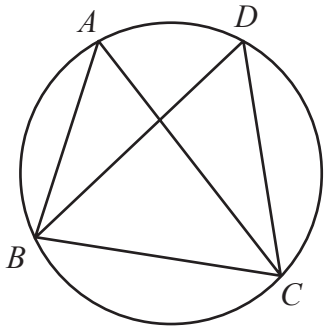
A total of 248 candles were sold.

Work out the number of red candles sold.

.....

**(Total for Question 15 is 4 marks)**

**16** In the figure below, $BC$ is the chord of the circle, $A$ and $D$ are points on the circumference of the circle.



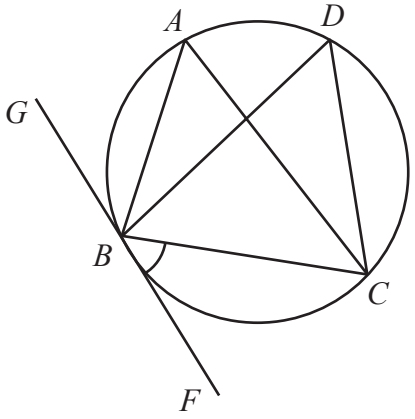

(a) John says,
"Measures of Angle $BAC$ and angle $BDC$ are the same."
Is John correct?
Give a reason for your answer.

.....

.....

**(1)**

(b) From point $B$, a tangent $GF$ is drawn.




Angle $CBF = 50°$
Angle $ACB = 45°$
Find the measure of angle $ABC$.
Give reasons at each stage of your working.

**(3)**

**(Total for Question 16 is 4 marks)**

**17** Line $A$ passes through the points (2, -5) and (9, -4)
Line $B$ passes through the points (6, $k$) and (2, -9)

Line $A$ and Line $B$ are perpendicular.

Find the value of $k$.

.....

**(Total for Question 17 is 3 marks)**

---

**18** (a) Write down the value of $125^{\frac{1}{3}}$

.....

**(1)**

(b) Find the value of $\left(\frac{27}{64}\right)^{\frac{2}{3}}$

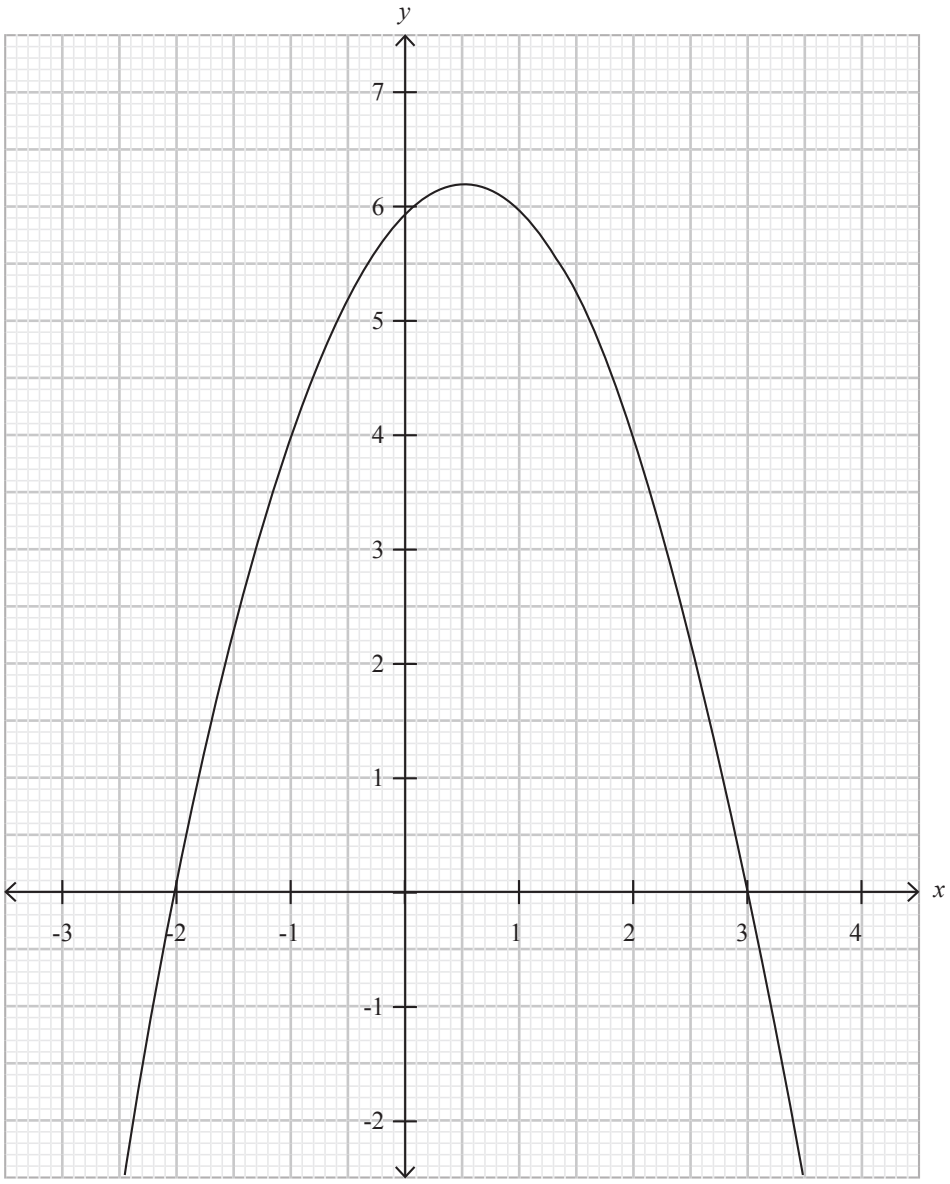
.....

**(2)**

**(Total for Question 18 is 3 marks)**

---

**19** The graph of $y = f(x)$ is drawn on the grid.




(a) Write down the coordinates of the turning point of the graph.

(..... , .....)

**(1)**

(b) Write down estimates for the roots of $f(x) = 0$

(..... , .....)

**(1)**

**(Total for Question 19 is 2 marks)**

**20** Ben starts cycling from point P on a bearing of 110° and cycles for 3 miles to reach point Q and then cycles 2.5 miles on a bearing of 030° and reaches point R.

Using scale of 1 cm = 1 mile

(a) Draw the scale diagram to show the cycling path of Ben.

**(2)**

(b) Work out how far Ben is from point P now.

..... miles

**(2)**

**(Total for Question 20 is 4 marks)**

**21** Danny buys packets of flavoured candies.

There are 6 vanilla flavoured candies in each packet of vanilla candies.
There are 14 chocolate flavoured candies in each packet of chocolate candies.

Danny buys equal numbers of vanilla and chocolate candies.
How many packets of candies of each flavour did Danny buy?

Vanilla = .....

Chocolate = .....

**(Total for Question 21 is 2 marks)**

---

**22** Paul, Fred and Luke went to buy pens.

Paul bought $p$ number of pens.

Fred bought 8 pens less than Paul.

Luke bought 4 times the number of pens than Fred.

Write an expression, in terms of $p$, for the mean number of pens Paul, Fred and Luke bought.

.....

**(Total for Question 22 is 2 marks)**

---

**23** Write down the nth term of the given sequence:

3 7 11 15

.....

**(Total for Question 23 is 1 mark)**

**TOTAL FOR PAPER IS 80 MARKS**