

Write your name and the date clearly.

Name

Date

Teach Me Maths

GCSE (9–1) Mathematics

For Pearson Edexcel GCSE Mathematics (1MA1)

Mock Set A

Time: 1 hour 30 minutes

Mathematics

PAPER 1 (Non-Calculator)

Higher Tier

You must have: a ruler marked in centimetres and millimetres, a protractor, a pair of compasses, a pen, an HB or B pencil, an eraser and the Formulae Sheet (last page). You may use tracing paper.

Total Marks

out of 80

Instructions

- Use **black** ink or a ball-point pen.
- If you use a pencil for diagrams, sketches or graphs, it must be dark (HB or B).
- **Write your name and the date** in the box at the top of this page.
- Answer **all** questions.
- Write your answers in the spaces provided – you may not need all the space.
- You must **show all your working**.
- Diagrams are **NOT** drawn accurately, unless the question says they are.
- **You must not use a calculator.**

Information

- This paper is out of 80 marks.
- The marks for **each** question are shown in brackets – use them to judge how long to spend on each question.

Advice

- Read each question carefully before you start your answer.
- Try to answer every question.
- If you have time at the end, check your answers.

Practice paper written by Teach Me Maths in the style of Pearson Edexcel GCSE Mathematics (1MA1). Not an official Pearson Edexcel paper.

Turn over ►

Answer **ALL** questions. Write your answers in the spaces provided.
You must write down all the stages in your working.

1 Work out $6.12 \div 0.36$

.....
(2)

(Total for Question 1 is 2 marks)

2 Work out $1\frac{3}{4} \times 2\frac{2}{9}$

Give your answer as a mixed number in its simplest form.

.....
(3)

(Total for Question 2 is 3 marks)

- 3** The price of a family ticket to a wildlife park increased by 20%
After the increase, the price of a family ticket was £57.60

Jodie says,

“The price of a family ticket before the increase was £46.08”

Is Jodie correct?

You must show how you get your answer.

(2)

(Total for Question 3 is 2 marks)

4 A youth orchestra has 168 members.

$\frac{3}{7}$ of the members play a string instrument.

Each of the other members plays either a brass instrument or a woodwind instrument.

number who play brass : number who play woodwind = 3:5

45% of the members who play woodwind are in their first year with the orchestra.

Work out the number of woodwind players who are in their first year with the orchestra.

.....
(5)

(Total for Question 4 is 5 marks)

- 5 The diagram shows a regular octagon $ABCDEFGH$ and a square $ABPQ$.
The straight line CP is drawn.

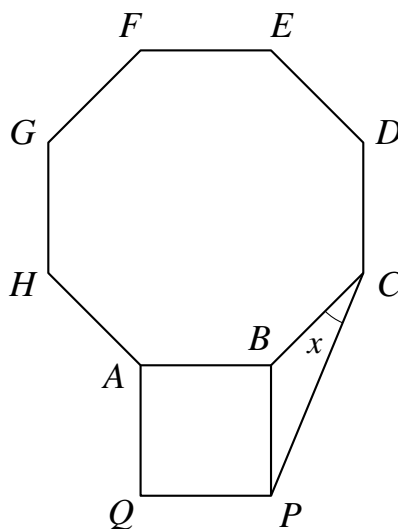


Diagram **NOT** accurately drawn

Work out the size of the angle marked x .

Give a reason for each stage of your working.

.....^o
(4)

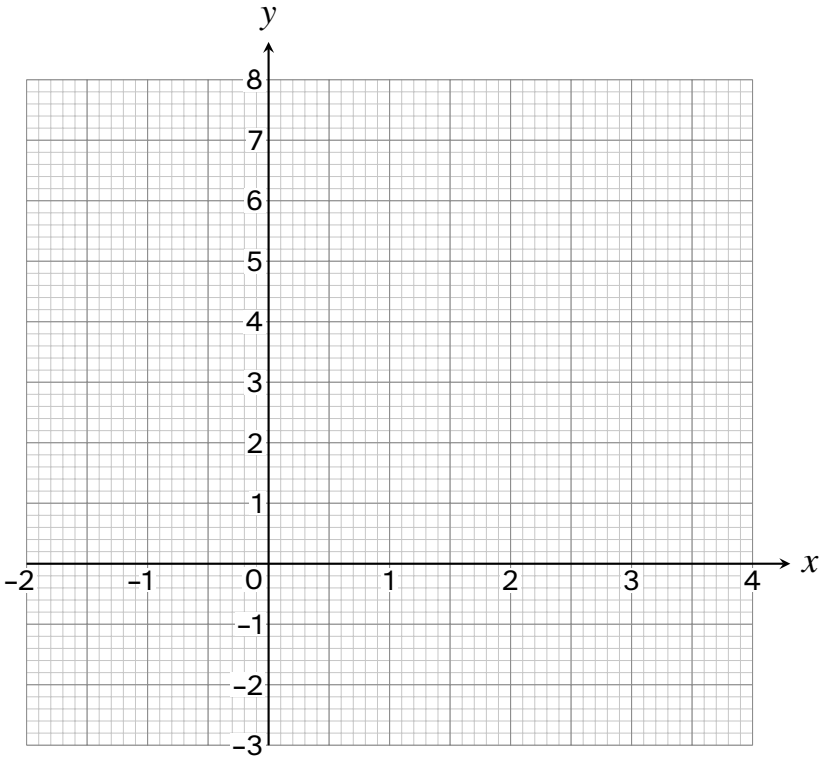
(Total for Question 5 is 4 marks)

6 (a) Complete the table of values for $y = x^2 - 2x - 1$

x	-2	-1	0	1	2	3	4
y	7	2			-1		7

(2)

(b) On the grid, draw the graph of $y = x^2 - 2x - 1$ for all values of x from -2 to 4



(2)

(c) Use your graph to find estimates of the solutions of $x^2 - 2x - 5 = 0$

.....
(2)

(Total for Question 6 is 6 marks)

- 7 The table shows information about the times, t minutes, that 50 customers spent queuing at a bakery on a Saturday morning.

Time (t minutes)	Frequency
$0 < t \leq 2$	7
$2 < t \leq 4$	12
$4 < t \leq 6$	15
$6 < t \leq 8$	10
$8 < t \leq 10$	6

Work out an estimate for the mean time.

..... minutes
(3)

(Total for Question 7 is 3 marks)

- 8 Find the exact value of $\left(\frac{8}{343}\right)^{-\frac{2}{3}}$

.....
(2)

(Total for Question 8 is 2 marks)

- 9 A school buys some calculators and some geometry sets.

5 calculators and 2 geometry sets cost a total of £53

3 calculators cost £7 more than 5 geometry sets.

Work out the cost of one calculator and the cost of one geometry set.

You must show all your working.

calculator £

geometry set £
(4)

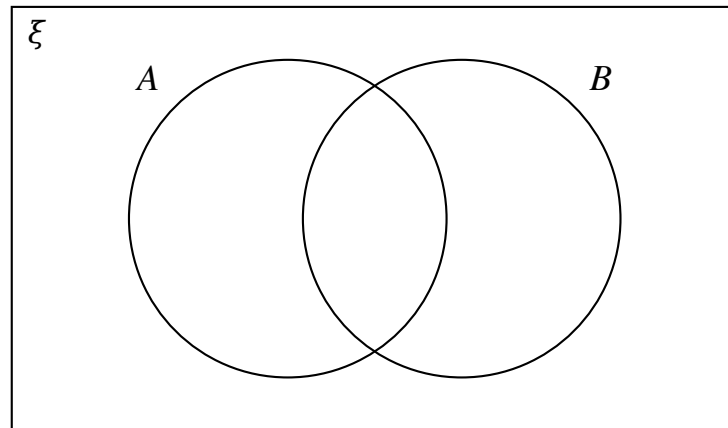
(Total for Question 9 is 4 marks)

10 $\xi = \{\text{whole numbers from 1 to 18}\}$

$A = \{\text{factors of 48}\}$

$B = \{\text{multiples of 3}\}$

(a) Complete the Venn diagram.



(2)

(b) Nia picks a number at random from ξ .

She says,

“The probability that my number is in $A \cup B$ is more than $\frac{2}{3}$ ”

Is Nia correct?

You must show how you get your answer.

(2)

(Total for Question 10 is 4 marks)

- 11** Prove algebraically that the recurring decimal $0.2\dot{4}\dot{5}$ can be written as $\frac{27}{110}$

(3)

(Total for Question 11 is 3 marks)

12 The diagram shows a logo for a café sign.

The logo is made from a sector OAB of a circle, centre O , and a right-angled triangle OBC .

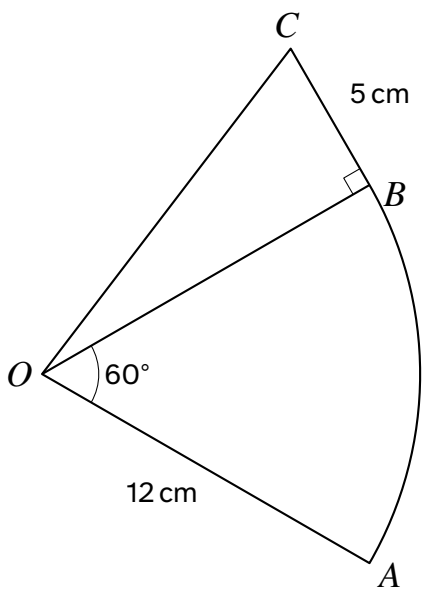


Diagram **NOT** accurately drawn

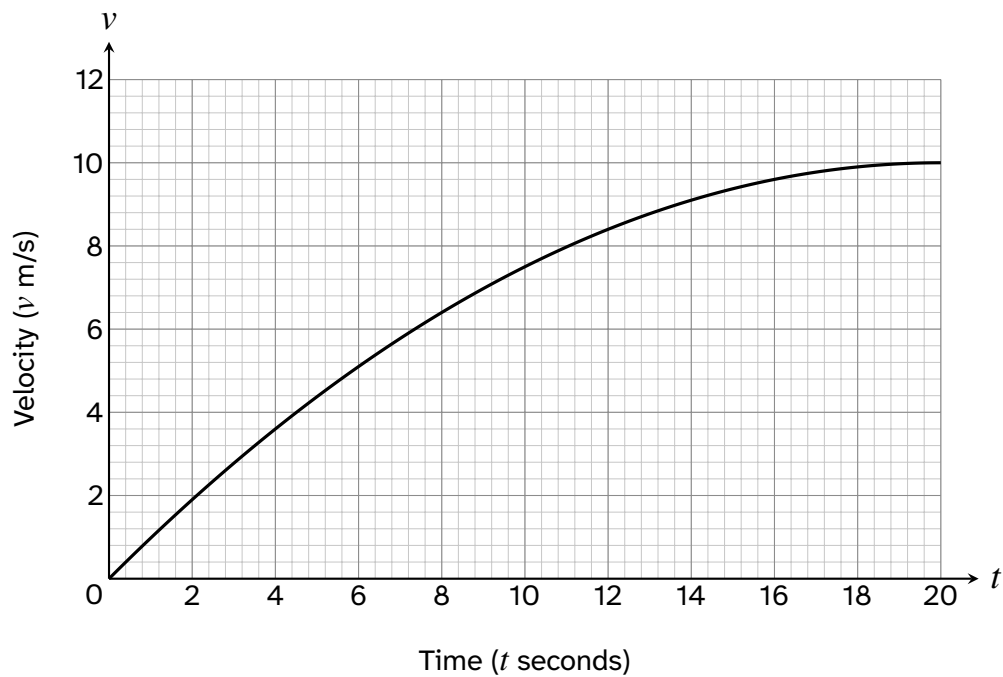
Work out the perimeter of the logo.
 Give your answer in the form $a + b\pi$, where a and b are integers.

..... cm
 (3)

(Total for Question 12 is 3 marks)

13 Zara cycles away from a set of traffic lights.

The graph shows information about her velocity, v m/s, t seconds after she starts.



- (a) Work out an estimate for the gradient of the graph at $t = 8$

.....
(3)

- (b) Zara says, “My acceleration is greater at $t = 16$ than at $t = 8$ ”

Is Zara correct?

Give a reason for your answer.

(1)

(Total for Question 13 is 4 marks)

14 m is directly proportional to the cube of r .

When $r = 3$, $m = 108$

Find the value of m when $r = 5$

$m = \dots\dots\dots$
(3)

(Total for Question 14 is 3 marks)

15 Make x the subject of $y = \frac{4x + 3}{x - 2}$

$x = \dots\dots\dots$
(4)

(Total for Question 15 is 4 marks)

- 16** At a party, a bowl contains n milk chocolates and 3 dark chocolates.
Ellis takes a chocolate at random and eats it.
He then takes a second chocolate at random and eats it.
The probability that Ellis eats two milk chocolates is $\frac{5}{14}$
Work out the number of chocolates in the bowl before Ellis took any.
You must show all your working.

.....
(4)

(Total for Question 16 is 4 marks)

17 (a) Simplify $\sqrt{245}$

.....
(1)

(b) Rationalise the denominator of $\frac{30}{\sqrt{12}}$
Give your answer in its simplest form.

.....
(2)

(Total for Question 17 is 3 marks)

18 A , B and C are points on a circle, centre O .

TAS is the tangent to the circle at A .

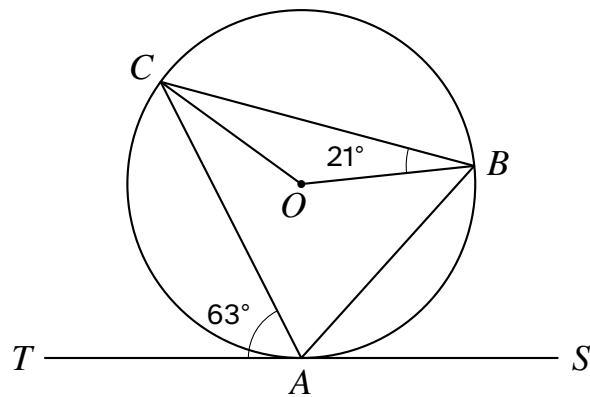


Diagram **NOT** accurately drawn

Work out the size of angle ACB .

You must give a reason for each stage of your working.

..... °
(4)

(Total for Question 18 is 4 marks)

19 The functions f and g are such that

$$f(x) = \frac{2x + 7}{3} \qquad g(x) = 3x - 2$$

- (a) Find $fg(x)$
Give your answer in its simplest form.

.....
(2)

- (b) Find $f^{-1}(x)$

.....
(2)

(Total for Question 19 is 4 marks)

- 20** Prove algebraically that, for any two consecutive multiples of 3, the difference between their squares is always an odd multiple of 9

(3)

(Total for Question 20 is 3 marks)

21 C is the circle with equation $x^2 + y^2 = 52$

The line L is the tangent to C at the point P .

The x -coordinate of P is positive.

L is parallel to the line with equation $4x + 6y = 15$

Find an equation of L .

You must show all your working.

.....
(5)

(Total for Question 21 is 5 marks)

22 $OABC$ is a parallelogram.

$$\overrightarrow{OA} = \mathbf{a} \text{ and } \overrightarrow{OC} = \mathbf{c}$$

D is the point on OA such that $OD:DA = 2:1$

CBF is a straight line such that B is the midpoint of CF .

E is the point on AB such that D, E and F lie on a straight line.

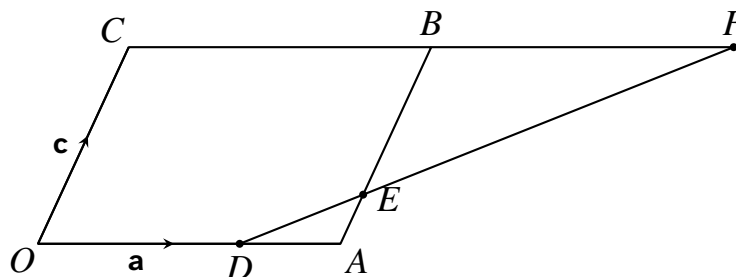


Diagram **NOT** accurately drawn

Work out the ratio $AE:EB$

You must show all your working.

.....
(5)

(Total for Question 22 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS

Formulae Sheet

For Pearson Edexcel GCSE Mathematics (1MA1) • Higher Tier

Perimeter, area and volume

Where a and b are the lengths of the parallel sides and h is their perpendicular separation:

$$\text{Area of a trapezium} = \frac{1}{2}(a + b)h$$

Volume of a prism = area of cross section $\times$ length

Where r is the radius and d is the diameter:

$$\text{Circumference of a circle} = 2\pi r = \pi d$$

$$\text{Area of a circle} = \pi r^2$$

Quadratic formula

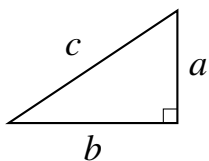
The solution of $ax^2 + bx + c = 0$ where $a \neq 0$:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Pythagoras' Theorem and Trigonometry

In any right-angled triangle where a , b and c are the lengths of the sides and c is the hypotenuse:

$$a^2 + b^2 = c^2$$

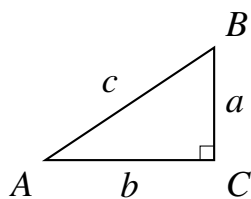


In any right-angled triangle ABC where a , b and c are the lengths of the sides and c is the hypotenuse:

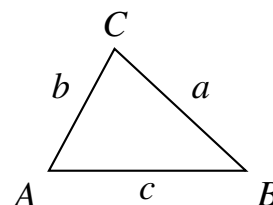
$$\sin A = \frac{a}{c}$$

$$\cos A = \frac{b}{c}$$

$$\tan A = \frac{a}{b}$$



In any triangle ABC where a , b and c are the lengths of the sides:



$$\text{sine rule: } \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\text{cosine rule: } a^2 = b^2 + c^2 - 2bc \cos A$$

$$\text{Area of triangle} = \frac{1}{2}ab \sin C$$

Compound Interest

Where P is the principal amount, r is the interest rate over a given period and n is the number of times that the interest is compounded:

$$\text{Total accrued} = P \left(1 + \frac{r}{100} \right)^n$$

Probability

Where $P(A)$ is the probability of outcome A and $P(B)$ is the probability of outcome B :

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$P(A \text{ and } B) = P(A \text{ given } B) P(B)$$