

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 2 (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, a calculator 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 may use a calculator.
- If your calculator does not have a π button, use 3.142 for π unless the question says otherwise.

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 (a) Cerys simplifies $(2x^3y)^4$

Here is her answer.

$$(2x^3y)^4 = 8x^{12}y^4$$

What mistake has Cerys made?

(1)

- (b) Factorise fully $12xy^2 - 18x^2y$

.....
(2)

- (c) Expand and simplify $(4x - 3)(x + 6)$

.....
(2)

(Total for Question 1 is 5 marks)

- 2 Use your calculator to work out

$$\frac{\sqrt{48.6} + 2.7^3}{5 \tan 38^\circ}$$

Give your answer correct to 3 significant figures.

.....
(2)

(Total for Question 2 is 2 marks)

- 3 LMN is a right-angled triangle.

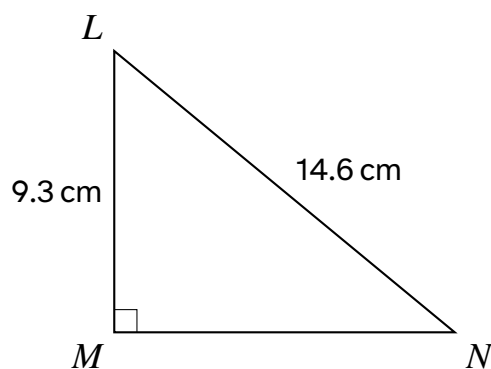


Diagram **NOT** accurately drawn

Work out the length of MN .

Give your answer correct to 3 significant figures.

..... cm
(2)

(Total for Question 3 is 2 marks)

- 4 (a) Write 936 as a product of its prime factors.

.....
(2)

(b) $A = 2^3 \times 3 \times 5^2$

$$B = 2 \times 3^4 \times 7$$

Write down the lowest common multiple (LCM) of A and B .

Give your answer as a product of powers of its prime factors.

.....
(1)

(Total for Question 4 is 3 marks)

- 5 Marek needs 18 rolls of garden fleece to cover his vegetable beds.

Two shops sell the same rolls of fleece.

Shop A	Shop B
£8.20 per roll Buy 3 rolls, get 1 more roll free	£7.25 per roll 20% off the total cost when you spend more than £100

Which shop is cheaper for 18 rolls of fleece, and by how much?

You must show all your working.

.....
(4)

(Total for Question 5 is 4 marks)

- 6 The mass of a newborn kitten is m grams.

$m = 110$ correct to 2 significant figures.

Complete the error interval for m .

..... $\leq m <$
(2)

(Total for Question 6 is 2 marks)

- 7 Ines buys a used electric scooter for £1250

The value of the scooter falls by 18% in the first year.

Its value then falls by 9% in each of the next two years.

Ines says,

“At the end of the 3 years, the scooter will have lost more than a third of its value.”

Is Ines correct?

You must show how you get your answer.

(3)

(Total for Question 7 is 3 marks)

- 8** A bag of sand contains 2.45×10^6 grains of sand.

The total mass of the sand in the bag is 2.2×10^3 grams.

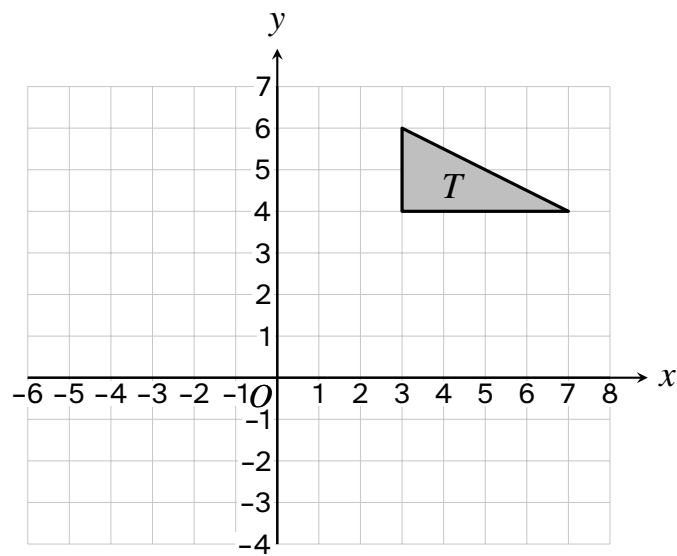
Work out the mean mass of one grain of sand.

Give your answer in standard form correct to 3 significant figures.

..... g
(2)

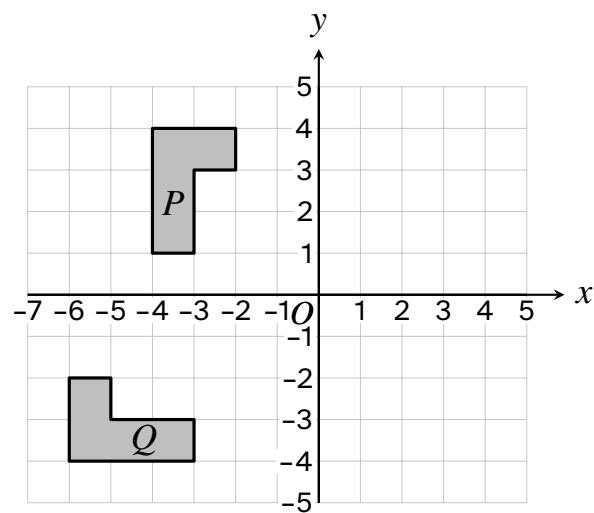
(Total for Question 8 is 2 marks)

- 9 (a) On the grid, enlarge triangle T by scale factor $-\frac{1}{2}$ with centre of enlargement $(-1, 0)$



(2)

- (b) Describe fully the single transformation that maps shape P onto shape Q .



(2)

(Total for Question 9 is 4 marks)

10 Solve $\frac{5x+2}{3} - \frac{2x-7}{4} = 2$

Show clear algebraic working.

$x = \dots\dots\dots$
(3)

(Total for Question 10 is 3 marks)

11 The Hawks netball team play two matches.

Each match is either won or lost.

The probability that the Hawks win the first match is 0.55

If the Hawks win the first match, the probability that they win the second match is 0.7

If the Hawks lose the first match, the probability that they win the second match is 0.4

The coach of the Hawks says,

“We are more likely to win exactly one of the matches than to win both.”

Is the coach correct?

You must show all your working.

(3)

(Total for Question 11 is 3 marks)

12 Here are the first five terms of a quadratic sequence.

5 12 25 44 69

Find an expression, in terms of n , for the n th term of this sequence.

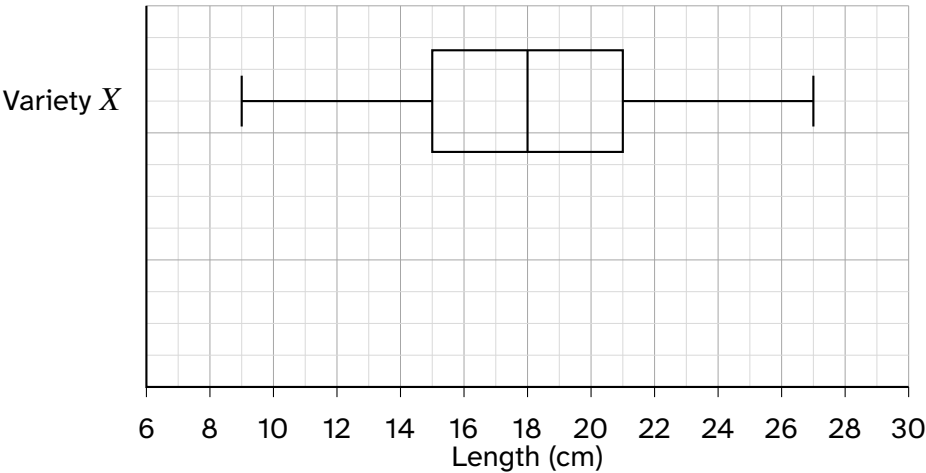
.....
(3)

(Total for Question 12 is 3 marks)

- 13** Kit grows two varieties of runner bean, variety X and variety Y .
 She measures the length, in cm, of each bean she picks.
 The box plot shows information about the lengths of the beans of variety X .
 The table shows information about the lengths of the beans of variety Y .

Shortest length	12 cm
Lower quartile	19 cm
Median	22 cm
Upper quartile	24 cm
Longest length	29 cm

- (a) On the grid, draw a box plot for the information about the beans of variety Y .



(2)

- (b) Compare the distribution of the lengths of the beans of variety X with the distribution of the lengths of the beans of variety Y .

(2)

(Total for Question 13 is 4 marks)

- 14** Ola makes 920 cm^3 of plant feed by mixing concentrate with water.
She mixes them so that volume of concentrate : volume of water = 3:20

The density of the concentrate is 1.36 g/cm^3

The density of water is 1 g/cm^3

Work out the density of the plant feed.

Give your answer correct to 3 significant figures.

..... g/cm^3
(4)

(Total for Question 14 is 4 marks)

- 15** The diagram shows a shape made by cutting a square from one corner of a rectangle. The rectangle is $(3x + 2)$ cm long and $(2x - 1)$ cm wide. The square has sides of length x cm.
- The area of the shape is 25 cm^2

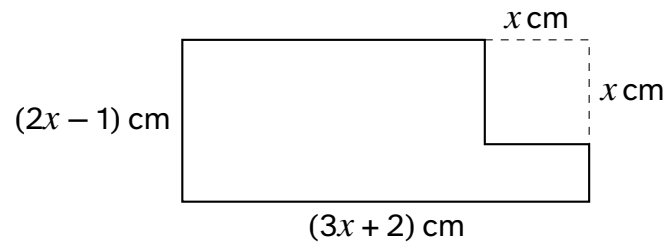


Diagram **NOT** accurately drawn

- (a) Show that $5x^2 + x - 27 = 0$

(2)

- (b) Work out the perimeter of the shape.
- Give your answer correct to 3 significant figures.
- You must show all your working.

..... cm
(3)

(Total for Question 15 is 5 marks)

16 Silas wants to estimate the number of snails in his garden.

On Saturday he catches 42 snails.

He puts a small dot of paint on the shell of each snail and then releases them.

On Sunday he catches 55 snails.

7 of these snails have a dot of paint on their shell.

(a) Work out an estimate for the number of snails in Silas's garden.

.....
(3)

(b) Silas finds out that the paint had come off some of the marked snails before he caught the snails on Sunday.

How does this affect your answer to part (a)?

Give a reason for your answer.

.....
.....
.....
(1)

(Total for Question 16 is 4 marks)

.....

17 The line **L** has equation $3y + 2x = 12$

Find an equation of the line that is perpendicular to **L** and passes through the point $(-4, 5)$

.....
(3)

(Total for Question 17 is 3 marks)

18 Farah and Jonah each have some savings.

Farah's savings : Jonah's savings = 5:2

Their grandmother gives each of them £30

Jonah now has $\frac{3}{5}$ of the amount that Farah now has.

How much money did Farah and Jonah each have before their grandmother gave them the money?

You must show all your working.

Farah £

Jonah £
(4)

(Total for Question 18 is 4 marks)

19 EFG is a triangle.

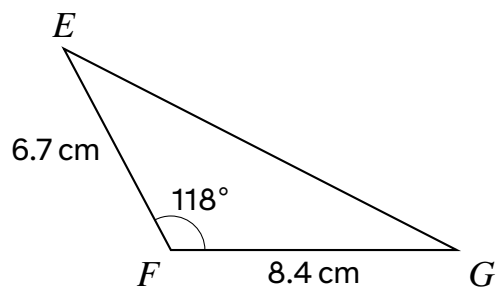


Diagram **NOT** accurately drawn

Work out the area of triangle EFG .

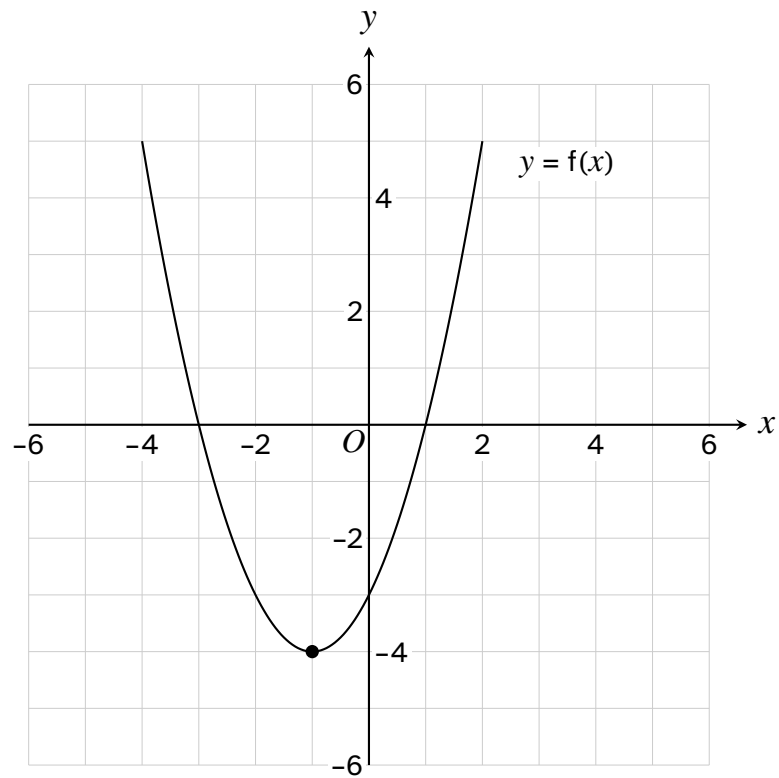
Give your answer correct to 3 significant figures.

..... cm^2
(2)

(Total for Question 19 is 2 marks)

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

The graph has a turning point at $(-1, -4)$



On the grid, sketch the graph of $y = -f(x - 2)$

(2)

(Total for Question 20 is 2 marks)

21 The diagram shows a plan of a plot of land, $ABCD$.

A path runs along the diagonal AC .

$AB = 52\text{ m}$, $BC = 38\text{ m}$, $AC = 71\text{ m}$

Angle $DAB = 76^\circ$

Angle $ADC = 60^\circ$

Daniel is going to put a fence along the whole boundary of the plot of land.

Fencing is sold in rolls. Each roll is 20 m long and costs £37.50

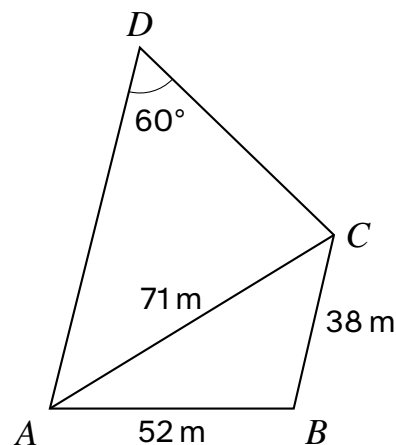


Diagram **NOT** accurately drawn

Work out the total cost of the fencing Daniel needs to buy.

You must show all your working.

£
(6)

(Total for Question 21 is 6 marks)

22 Find the set of values of x for which

$$3x^2 + x - 14 \leq 0 \quad \text{and} \quad 4 - 3x < 2x + 9$$

You must show all your working.

.....
(4)

(Total for Question 22 is 4 marks)

23 Can A and can B are mathematically similar.

The total surface area of can A is 880 cm^2

The total surface area of can B is 1430 cm^2

When both cans are full of olive oil, can B holds 1.95 kg more olive oil than can A .

The density of olive oil is 0.91 g/cm^3

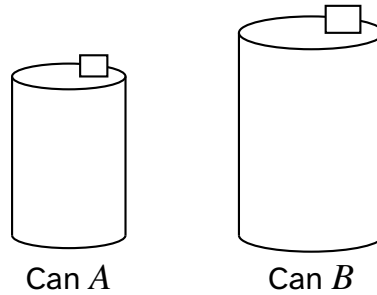


Diagram **NOT** accurately drawn

Work out the volume of olive oil that can A holds when it is full.

Give your answer in litres, correct to 3 significant figures.

You must show all your working.

..... litres
(6)

(Total for Question 23 is 6 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

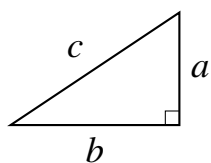
The solution of
 $ax^2 + bx + c = 0$
where $a \neq 0$:

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

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:

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

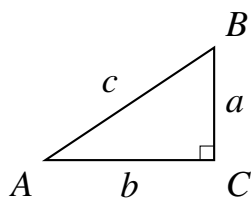


In any right-angled triangle ABC where a , b and c are the lengths of the sides and c is the hypotenuse:

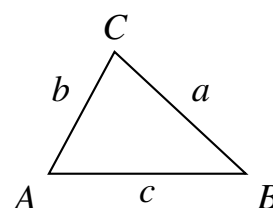
$$\sin A = \frac{a}{c}$$

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

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



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 :

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

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