

Edexcel GCSE Maths – Practice Paper 2 (Calculator)

Paper 2: Calculator

Time: 1 hour 30 minutes

Total Marks: 80

Instructions:

- Use a calculator where appropriate.
 - Answer all questions.
 - Show all working clearly.
 - Diagrams are not necessarily drawn to scale.
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1. Fractions, Decimals, Percentages (4 marks)

A coat is reduced in a 20% sale. The sale price is £72.
Work out the original price of the coat.

2. Algebraic Manipulation (4 marks)

Simplify the expression:

$$3(2x-4)+2(x+5)3(2x-4) + 2(x+5)3(2x-4)+2(x+5)$$

3. Ratio & Proportion (4 marks)

In a recipe, flour, sugar and butter are mixed in the ratio 3 : 2 : 1.
If 360g of mixture is made, how much sugar is used?

4. Probability (5 marks)

A bag contains 3 red, 4 blue and 5 green counters.
One counter is taken out at random.

What is the probability it is:

- a) red
 - b) not green
 - c) blue or red
-

5. Sequences (3 marks)

Write down the first 4 terms of the sequence:

$$3n^2 + 23n + 2$$

6. Geometry – Angles (4 marks)

A straight line intersects two parallel lines.

Give reasons to support your answer:

- a) Alternate angles
 - b) Corresponding angles
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7. Trigonometry (5 marks)

In a right-angled triangle, the hypotenuse is 13 cm and one angle is 25° .

Calculate the length of the side opposite the 25° angle.

(Give your answer to 2 decimal places.)

8. Statistics – Averages (5 marks)

The table shows the number of goals scored in football matches:

Goals	Frequency
0	4
1	8
2	10
3	5
4	3

- a) Work out the mean number of goals per match.
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9. Algebra – Solving Equations (4 marks)

Solve:

$$2x+5=3x-7 \quad 2x+5=3x-7$$

10. Pythagoras' Theorem (4 marks)

A triangle has sides of length 10 cm and 24 cm.

The hypotenuse is unknown.

Find the length of the hypotenuse.

11. Graphs – Functions (6 marks)

The graph of $y=x^2-3x-4$ is drawn.

- Find the coordinates of the roots.
 - State the turning point.
 - Sketch the graph.
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12. Surface Area & Volume (6 marks)

A cylinder has a radius of 4 cm and a height of 10 cm.

- Work out the surface area.
 - Work out the volume.
- (Use $\pi=3.14$)
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13. Vectors (5 marks)

Point A has position vector $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$ and

point B has position vector $\begin{pmatrix} 7 \\ -1 \end{pmatrix}$.

Find the vector \overrightarrow{AB} and the magnitude of this vector.

14. Simultaneous Equations (5 marks)

Solve:

$$\begin{aligned} 3x+2y &= 16 \\ 2x-y &= 1 \end{aligned}$$

Answers

Mark Scheme

1. Percentages

Sale price = £72

Let original price be xxx:

$$0.8x=72 \Rightarrow x=90 \quad 0.8x = 72 \Rightarrow x = 90$$

Answer: £90

2. Algebraic Expansion

$$3(2x-4)+2(x+5)=6x-12+2x+10=8x-2$$
$$23(2x-4)+2(x+5)=6x-12+2x+10=8x-2$$

Answer: $8x-2$

3. Ratio

Total parts = 3 + 2 + 1 = 6

$$\text{Sugar} = \frac{2}{6} \times 360 = 120 \text{g}$$

Answer: 120g

4. Probability

Total = 3 + 4 + 5 = 12

$$\text{a) Red} = \frac{3}{12} = \frac{1}{4}$$

$$\text{b) Not green} = \frac{7}{12}$$

$$\text{c) Blue or red} = \frac{3+4}{12} = \frac{7}{12}$$

Answers: a) $\frac{1}{4}$, b) $\frac{7}{12}$, c) $\frac{7}{12}$

5. Sequences

$$n=1 \rightarrow 3(1)^2 + 2 = 5 \quad n=2 \rightarrow 3(2)^2 + 2 = 14$$

$$n=3 \rightarrow 3(3)^2 + 2 = 29 \quad n=4 \rightarrow 3(4)^2 + 2 = 50$$

Answer: 5, 14, 29, 50

6. Angles

- a) Alternate angles are equal
- b) Corresponding angles are equal

Answers: See above

7. Trigonometry

Opposite = $\sin(25^\circ) \times 13 = 0.4226 \times 13 \approx 5.49$
 $\sin(25^\circ) \times 13 = 0.4226 \times 13 \approx 5.49$

Answer: 5.49 cm

8. Statistics – Mean

$(0 \times 4 + 1 \times 8 + 2 \times 10 + 3 \times 5 + 4 \times 3) / 30 = (0 + 8 + 20 + 15 + 12) / 30 = 55 / 30 = 1.8\bar{3}$

Answer: 1.83 (2 dp)

9. Solve Equation

$2x + 5 = 3x - 7 \Rightarrow 12 = x$
 $2x + 5 = 3x - 7 \Rightarrow 12 = x$

Answer: $x = 12$

10. Pythagoras' Theorem

$10^2 + 24^2 = 100 + 576 = 676 = 26^2$
 $\sqrt{10^2 + 24^2} = \sqrt{100 + 576} = \sqrt{676} = 26$

Answer: 26 cm

11. Graph & Roots

a) Factor: $(x-4)(x+1) \Rightarrow x = 4, -1$

b) Turning point: $x = -\frac{b}{2a} = \frac{3}{2} = 1.5$

$y = (1.5)^2 - 3(1.5) - 4 = -6.25$

Answers: a) $x = 4, -1$; b) (1.5, -6.25)

12. Surface Area & Volume

a) SA = $2\pi r^2 + 2\pi rh = 2(3.14)(16) + 2(3.14)(4)(10) = 100.48 + 251.2 = 351.68$

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b) Volume = $\pi r^2 h = 3.14 \times 16 \times 10 = 502.4$

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Answers: a) 351.68 cm², b) 502.4 cm³

13. Vectors

$$\overrightarrow{AB} = (7-2, -1-3) = (5, -4)$$

$$\text{Magnitude} = \sqrt{5^2 + (-4)^2} = \sqrt{25 + 16} = \sqrt{41} \approx 6.4$$

Answers: $(5, -4)$, magnitude ≈ 6.4

14. Simultaneous Equations

$$\text{Multiply second by 2: } 4x - 2y = 24 \Rightarrow 4x - 2y = 24$$

$$\text{Now add: } 3x + 2y + 4x - 2y = 16 + 24 \Rightarrow 7x = 40 \Rightarrow x = \frac{40}{7}$$

$$\text{Sub back: } 2x - y = 1 \Rightarrow 2\left(\frac{40}{7}\right) - y = 1 \Rightarrow \frac{80}{7} - y = 1 \Rightarrow y = \frac{73}{7}$$

Answer: $x = \frac{40}{7}, y = \frac{73}{7}$
