

GCSE Mathematics — Higher Tier

Mixed practice paper · Calculator allowed

Name: _____

Date: _____

Total: **37 marks**

Instructions

- Answer all questions in the spaces provided.
- Show all working. Marks may be awarded for method.
- Diagrams are not drawn to scale.
- Calculators may be used unless a question says otherwise.

1 Product rule for counting

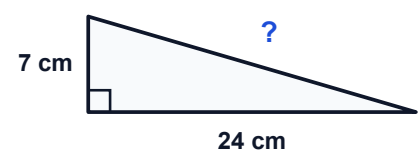
2 marks

A student owns 3 tops, 9 skirts and 2 pairs of shoes. One outfit consists of a top, a skirt and a pair of shoes. Work out how many different outfits are possible.

2 Pythagoras

2 marks

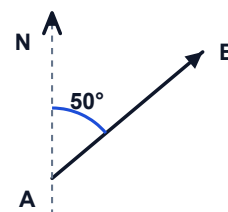
A right-angled triangle has shorter sides of length 7 cm and 24 cm. Work out the length of the hypotenuse.



3 Bearings

2 marks

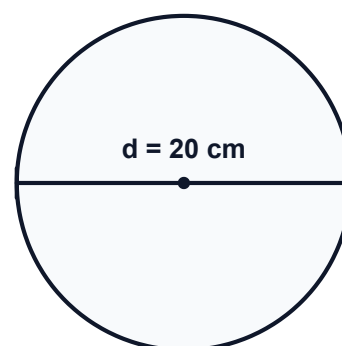
The bearing of B from A is 050° . Work out the bearing of A from B.
Give your answer as a three-figure bearing.



4 Area of a circle

2 marks

A circle has diameter 20 cm. Work out its area in terms of π .



5 Recurring decimals

3 marks

Write $0.\overline{64}$ as a fraction in its simplest form.

6 Histograms

2 marks

The table shows the times, t minutes, taken by a group of students to complete a task.

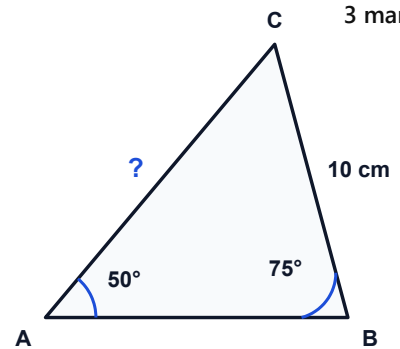
Time (t minutes)	Frequency
$0 < t \leq 10$	12
$10 < t \leq 25$	30
$25 < t \leq 40$	27
$40 < t \leq 60$	18

Work out the frequency density for the class $25 < t \leq 40$.

7 Sine rule

3 marks

In triangle ABC, angle A = 50° , angle B = 75° and side a = 10 cm. Work out the length of side b. Give your answer to 3 significant figures.



8 Mean from a frequency table

3 marks

The table shows the number of goals scored by a football team in each of its matches.

Goals	Frequency
0	5
1	6
2	3
3	1
4	2

Work out the mean number of goals per match. Give your answer to 2 decimal places.

9 Geometric sequences

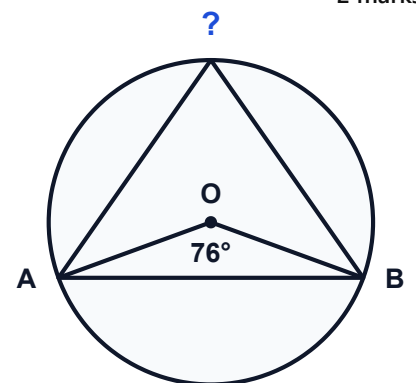
2 marks

The first three terms of a geometric sequence are 2, 6, 18. Work out the 10th term.

10 Circle theorems

2 marks

A, B and C are points on a circle, centre O. Angle AOB = 76° . Work out the size of angle ACB. Give a reason for your answer.



11 Algebraic fractions

2 marks

Simplify $\frac{x^2 - 16}{x - 4}$.

12 Work problems

3 marks

Owen can deliver leaflets in 10 hours. Mia can deliver leaflets in 15 hours. Working together, how long will they take? Give your answer in hours.

13 Solving quadratics by factorising

3 marks

Solve $x^2 - 36 = 0$ by factorising.

14 Meeting problems

3 marks

Two towns, Dover and Farnham, are 345 km apart. A car leaves Dover at 60 km/h travelling towards Farnham. At the same time a van leaves Farnham at 55 km/h travelling towards Dover. How long will it be before they meet? Give your answer in hours.

A car travels at an average speed of 60 mph for 3 hours and 30 minutes. Work out the distance travelled.
