cookie

Practice paper

GCSE Maths Higher, practice paper 2 (calculator) (AQA style)

In the style of AQA GCSE Mathematics (8300) Paper 2 Higher

Practice paper written by cookie in the style of AQA GCSE Mathematics (8300) Paper 2 Higher. Not an AQA paper; not affiliated with or endorsed by AQA.

Time allowed: 1 hour 30 minutes

Total marks: 80

You may use a calculator.

Name _____

Instructions

- Answer all questions.
- Answer the questions in the spaces provided.
- You may use a calculator.
- In all calculations, show clearly how you work out your answer.
- The marks for each question are shown in brackets.
- The maximum mark for this paper is 80.
- Diagrams are not used in this paper; where a shape is needed it is described in words.

Information

- The marks for each question are shown in brackets.
- The maximum mark for this paper is 80.

Do it online, timed and marked:
cookie.education/past-papers/gcse/cookie/maths-aqa-style

Answer all questions in the spaces provided.

0 1 Work out $4.8^2 + \sqrt{20}$
Give your answer correct to 1 decimal place.
Circle your answer.

A 14.1 B 25.3 C 27.5 D 27.6

[1 mark]

---

0 2 y is directly proportional to x.
When x = 6, y = 15
What is the value of y when x = 10?
Circle your answer.

A 4 B 19 C 25 D 30

[1 mark]

---

0 3 Which of these is the equation of a line parallel to $y = 3x - 2$?
Circle your answer.

A $y = -3x + 1$ B $y = 3x + 5$ C $y = 1/3\ x - 2$ D $y = -1/3\ x + 4$

[1 mark]

---

0 4 Here are the first four terms of a sequence.
2 6 18 54
What type of sequence is it?
Circle your answer.

A arithmetic B geometric C quadratic D Fibonacci

[1 mark]

---

0 5 Sam invests £4500 in a savings account.
The account pays 3.2% compound interest per year.
Work out the value of Sam's investment at the end of 5 years.

[3 marks]

Answer .....

---

0 6 A solid metal block is a cuboid.
It measures 12 cm by 5 cm by 4 cm.
The density of the metal is 7.8 g/cm^3.

0 6 . 1 Work out the mass of the block.
Give your answer in kilograms.

[2 marks]

Answer .....

0 6 . 2 The block rests on a table with its 12 cm by 5 cm face on the table.
The block exerts a force of 18.4 newtons on the table.
pressure = force ÷ area
Work out the pressure on the table.
Give your answer in newtons per square metre (N/m^2).

[3 marks]

Answer .....

---

0 7 A ladder 6.5 m long leans against a vertical wall.
The foot of the ladder is on horizontal ground, 1.8 m from the bottom of the wall.
Work out the angle between the ladder and the ground.
Give your answer correct to 1 decimal place.

[3 marks]

Answer .....

---

0 8 A new car costs £18 500.
Its value falls by 12% each year.

0 8 . 1 Work out the value of the car after 3 years.

[2 marks]

Answer .....

0 8 . 2 After how many complete years will the value of the car first be less than half of £18 500?
You must show your working.

[2 marks]

Answer .....

---

0 9 . 1 There are 80 students in a year group.
45 study French.
30 study Spanish.
17 study neither French nor Spanish.
A student is chosen at random from the year group.
Work out the probability that the student studies exactly one of the two languages.

[3 marks]

Answer .....

0 9 . 2 A student who studies Spanish is chosen at random.
Work out the probability that this student also studies French.

[1 mark]

Answer .....

---

10 A runner covers a distance of 140 m, correct to the nearest 5 m.
The time she takes is 15.8 seconds, correct to 1 decimal place.
Work out the lower bound for her average speed.
Give your answer correct to 3 significant figures.

[3 marks]

Answer .....

11 A ship sails 14 km from a port P to a point Q, on a bearing of 060°.
It then sails 9 km from Q to a point R, on a bearing of 150°.
Work out
• the distance PR
• the bearing of R from P, to the nearest degree.

[5 marks]

Answer .....

12 Solve $3x^2 - 7x - 2 = 0$
Give your answers correct to 2 decimal places.

[3 marks]

Answer .....

13 The table gives information about the times, in minutes, that two groups of students took to finish a puzzle.

	Group A	**Group B**
Shortest time	6	9
Lower quartile	11	13
Median	17	15
Upper quartile	24	18
Longest time	35	27

Compare the times of the two groups.
Give two comparisons. One must be about an average and one must be about the spread.

[3 marks]

Answer .....

---

14 Two bottles are mathematically similar.
The smaller bottle has a height of 12 cm.
The larger bottle has a height of 18 cm.

1 4 . 1 The smaller bottle holds 320 ml.
Work out how much the larger bottle holds.

[2 marks]

Answer .....

1 4 . 2 The surface area of the larger bottle is 486 cm^2.
Work out the surface area of the smaller bottle.

[2 marks]

Answer .....

---

15 A sector of a circle has radius 8.5 cm.
The angle at the centre of the sector is 140°.
Work out the perimeter of the sector.
Give your answer correct to 3 significant figures.

[3 marks]

Answer .....

---

1 6 . 1 In triangle ABC
AB = 9.2 cm
AC = 7.5 cm
angle BAC = 48°
Work out the length of BC.
Give your answer correct to 3 significant figures.

[3 marks]

Answer .....

16.2 Work out the area of triangle ABC.
Give your answer correct to 3 significant figures.

[2 marks]

Answer .....

---

17 A solid is made from a cylinder and a hemisphere.
The cylinder has radius 3 cm and height 10 cm.
The hemisphere has radius 3 cm and sits exactly on one end of the cylinder.
The solid is made of metal with a density of 8.9 g/cm^3.
Volume of a sphere = $4/3 \times \pi \times r^3$, where r is the radius.
Work out the mass of the solid.
Give your answer in kilograms, correct to 3 significant figures.

[4 marks]

Answer .....

---

18 The number of bacteria, N, in a sample after t hours is given by
$N = 500 \times 1.8^t$

18.1 Work out the number of bacteria after 4 hours.
Give your answer to the nearest whole number.

[1 mark]

Answer .....

18.2 After how many complete hours will the number of bacteria first be more than 100 000?
You must show your working.

[2 marks]

Answer .....

---

19 $x^3 + 4x - 9 = 0$

19.1 Show that the equation has a solution between x = 1 and x = 2

[2 marks]

Answer .....

19.2 Use the iteration formula $x_{n+1} = \sqrt[3]{(9 - 4x_n)}$ with $x_1 = 1.5$
to work out the values of x_2, x_3 and x_4
Give each value correct to 4 decimal places.

[2 marks]

Answer .....

---

20 Make w the subject of
$a = (3w + 2)/(w - 5)$

[3 marks]

Answer .....

---

21 A car starts from rest.
The table shows its velocity, v metres per second, every 2 seconds for the first 8 seconds.
The velocity increases at a decreasing rate throughout the 8 seconds.

Time, t (seconds)	**0**	**2**	**4**	**6**	**8**
Velocity, v (m/s)	0	5.2	8.6	10.4	11.0

2 1 . 1 The distance travelled is the area under the velocity–time graph.
Use 4 strips of equal width to work out an estimate of the distance the car travels in the first 8 seconds.

[3 marks]

Answer .....

2 1 . 2 Is your answer to part (a) an underestimate or an overestimate of the actual distance?
Give a reason for your answer.

[1 mark]

Answer .....

---

22 Solve $3/(x + 2) + 2/(x - 1) = 1$
Give your answers correct to 2 decimal places.
You must show your working.

[4 marks]

Answer .....

---

23 A bag contains n sweets.
6 of the sweets are orange.
Hannah takes two sweets at random from the bag, without replacement.
The probability that both sweets are orange is 1/3

2 3 . 1 Show that $n^2 - n - 90 = 0$

[3 marks]

Answer .....

2 3 . 2 Work out how many sweets were in the bag before Hannah took any.

[2 marks]

Answer .....

---

24 The circle with equation $x^2 + y^2 = 20$ and the line with equation $y = x + 1$ meet at two points.
Work out the coordinates of the two points.
Give your answers correct to 2 decimal places.
You must show your working.

[4 marks]

Answer .....

END OF QUESTIONS