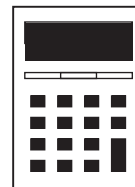


GCSE MATHEMATICS

Indices 1



AQA  These questions have been taken or modified from previous AQA GCSE Mathematics Papers.

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer **all** questions.
- You must answer the questions in the spaces provided.
- If your calculator does not have a π button, take the value of π to be 3.14 unless another value is given in the question.

Information

- The marks for questions are shown in brackets.
- The quality of your written communication is specifically assessed in questions that are indicated with an asterisk (*).

Advice

- Read each question carefully before you start to answer it.
 - In all calculations, show clearly how you work out your answer.
 - Use the number of marks for the question as a guide to the amount of time you need to spend.
 - Look at previous parts of the question, e.g. a), b), c) i) as there may be information there you need to answer later parts.
 - Check your answer is realistic and appropriate.
 - For calculator decimal numbers always write your full calculator display in the working out area and then, if you need to, round the answer on the answer line.
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1 Simplify $(2x^5y)^3$

.....
.....

Answer [2 marks]

2 x is a number between 0 and 1.

Write the following in numerical order, starting with the smallest.

\sqrt{x} x^2 x^0 $\frac{1}{x}$ x

.....
.....
.....
.....
.....

Answer [2 marks]

3 x is a number greater than 1.

Write the following in numerical order starting with the smallest.

$\frac{1}{x}$ x^{-2} $x^{\frac{1}{2}}$ x^3

.....
.....
.....

Answer [2 marks]

4 Find **two** sets of values for c and d such that

$$16^c = 2^d$$

.....
.....
.....
.....

$$c = \dots\dots\dots \text{ and } d = \dots\dots\dots$$

or $c = \dots\dots\dots \text{ and } d = \dots\dots\dots$

[3 marks]

5 (a) Work out the value of $9^{-\frac{3}{2}}$

.....
.....
.....

Answer

[2 marks]

5 (b) Work out **all** solutions of the equation

$$8^m = 2^{m^2}$$

.....
.....
.....
.....
.....

Answer

[3 marks]

- 6 A microscope slide has 2^8 bacteria on it.
The number of bacteria doubles every hour.

After how many hours are there 8^4 bacteria on the slide?

[3 marks]

.....
.....
.....
.....
.....
.....

Answer hours

7 $16^{-\frac{1}{4}} = n^{\frac{1}{3}}$

Work out the value of n .

[2 marks]

.....
.....
.....
.....
.....
.....

Answer

8

$$8^{\frac{2}{3}} \times 2^{-2} = 4^x$$

Work out the value of x .
You **must** show your working.

[4 marks]

Answer _____

9 (a) Complete this table.

3^0	3^1	3^2	3^3	3^4	3^5	3^6	3^7
1	3	9			243	729	2187

(2 marks)

9 (b) $729 \times 2187 = 1\,594\,323$
and $1\,594\,323 = 3^x$

Use the table to work out the value of x .

$x = \dots\dots\dots$ (1 mark)

9 (c) Use the table, or otherwise, to work out $\frac{2187}{9}$
Give your answer as a power of 3.

Answer $\dots\dots\dots$ (1 mark)