| Surname | |
|---|---|
| Other Names | |
| Candidate's Signature | |

# GCSE 9 - 1 Questions

## Fraction and Negative Indices 2

# Calculator Not Allowed

**INSTRUCTIONS TO CANDIDATES**

- Write your name in the space provided.

- Write your answers in the spaces provided in this question paper.

- Answer ALL questions.

- Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

- You should have a ruler, compass and protractor where required.

**Total Marks :**

1) Circle the correct answer for each of the following statements.

(a)   $9^{-\frac{1}{2}}$ is equal to

$$-3 \qquad -\frac{1}{3} \qquad \frac{1}{4\frac{1}{2}} \qquad -4\frac{1}{2} \qquad \frac{1}{3}$$    [1]

(b)   $8^{\frac{2}{3}}$ is equal to

$$5\frac{1}{3} \qquad 4 \qquad 6 \qquad 8\frac{2}{3} \qquad \frac{16}{24}$$    [1]

2) Evaluate $\left(\frac{27}{8}\right)^{-\frac{1}{3}}$.    [2]

3) *(a)* Evaluate $1000^{-\frac{1}{3}}$

Answer:      [2]

*(b)* Evaluate

(i) $7 \cdot 3^0$      [1]

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(ii) $27^{-\frac{2}{3}}$      [2]

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*(c)* Evaluate $3^{-2} \times 8^{\frac{1}{3}}$ .

Express your answer as a fraction.      [2]

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4) *(a)*  Express $1000^{-\frac{2}{3}}$ as a decimal.

[3]

*(b)*  Express $8^{-\frac{2}{3}}$ as a fraction.  [2]

*(c)*  Evaluate $25^{-\frac{3}{2}}$.  [2]

5) (a) Express $8^{-1}$ as a fraction.

Answer:         [1]

(b) Evaluate $16^{-\frac{1}{2}}$

Answer:         [2]

6) Evaluate    $\dfrac{25^{\frac{1}{2}} \times 18}{\sqrt{9^2}}$

Answer:         [3]

7) Express $100^{-\frac{1}{2}}$ as a fraction

Answer:         [2]

8) Dafydd works in a scientific research unit.
He has been asked to evaluate a number of results from experiments.

Complete the following table for Dafydd to give the values correct to 2 significant figures.    [3]

| Result | Value correct to 2 significant figures |
|---|---|
| $10^2 + 2^3$ | 110 |
| $\left(8^{\frac{1}{3}} + 4^{-\frac{1}{2}}\right)$ | |
| $2 \cdot 3 \times 10^{-1} + 9^0$ | |
| $\left(\sqrt[3]{125}\right)^2 + 12 \times 160000^{-\frac{1}{4}}$ | |

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9) Metric prefixes are used to describe large or small numbers.
The metric prefix 'milli', in millimetres or milligrams, is used to describe small numbers.
For example, 1 millimetre is $1000^{-1}$ metres which can also be written as $10^{-3}$ metres.

Complete the table below. [6]

| Metric prefix | $1000^x$ | $10^y$ | Standard form |
|---|---|---|---|
| hecto | $1000^{\frac{2}{3}}$ | ..................... | ................................. |
| tera | ..................... | $10^{12}$ | ................................. |
| deci | $1000^{-\frac{1}{3}}$ | ..................... | ................................. |
| yocto | ..................... | $10^{-24}$ | ................................. |

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