

Negative and Fractional Indices

For AQA GCSE Mathematics (8300) • Higher tier

Name _____

Total marks: **27**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method.
Do **not** use a calculator.

1 Work out the value of

(a) 5^{-2}

[1 mark]

Answer _____

(b) $64^{\frac{1}{2}}$

[1 mark]

Answer _____

(c) $27^{\frac{2}{3}}$

[1 mark]

Answer _____

(d) $16^{-\frac{3}{4}}$

[2 marks]

Answer _____

(e) $\left(\frac{27}{64}\right)^{-\frac{2}{3}}$

[2 marks]

Answer _____

2 Circle the value of $8^{-\frac{1}{3}}$

[1 mark]

-2

$-\frac{8}{3}$

$\frac{1}{2}$

$\frac{1}{24}$

3 Work out the value of $\left(\frac{2}{5}\right)^{-2} - 2^{-3}$
Give your answer as a mixed number.

[3 marks]

Answer _____

4 Find the value of x .

(a) $2^x = \frac{1}{32}$

[1 mark]

Answer $x =$ _____

(b) $3^x = 9\sqrt{3}$

[2 marks]

Answer $x =$ _____

(c) $16^x = 8$

[2 marks]

Answer $x =$ _____

5 Simplify fully

(a) $(x^6)^{\frac{1}{3}}$

[1 mark]

Answer _____

(b) $(16x^8y^{-4})^{\frac{1}{2}}$

[2 marks]

Answer _____

6 Write $\frac{4^3 \times 2^{-1}}{8^{\frac{2}{3}}}$ as a power of 2

[3 marks]

Answer _____

7 Write $\frac{1}{\sqrt{100^m}}$ as a power of 10 in terms of m .

[2 marks]

Answer _____

8 Write $\frac{8^{x+1}}{\sqrt{2}}$ as a power of 2 in terms of x .

[3 marks]

Answer _____