

Fractional and Negative Indices

ANSWERS

1

Work out $8^{\frac{2}{3}}$

the bottom is the root

2

the top is the power

4

Answer 4

2

Work out $27^{\frac{2}{3}}$

the bottom is the root

3

the top is the power

9

Answer 9

3

Work out $16^{\frac{3}{4}}$

the bottom is the root

2

the top is the power

8

Answer 8

4

Work out $25^{\frac{3}{2}}$

the bottom is the root

5

the top is the power

125

Answer 125

5

Work out 4^{-2}

the power

16

a negative means 1 over

$\frac{1}{16}$

Answer $\frac{1}{16}$

6

Work out 2^{-3}

the power

8

a negative means 1 over

$\frac{1}{8}$

Answer $\frac{1}{8}$

7

Find the value of n . $2^n = \frac{1}{8}$

$2^3 = 8$

Answer $n = -3$

8

Write $\frac{1}{25}$ as a power of 5.

$25 = 5^2$

Answer 5^{-2}

Fractional and Negative Indices *further practice*

ANSWERS

9

Work out

$64^{\frac{2}{3}}$

$\sqrt[3]{64} = 4, 4^2$

Answer 16

10

Work out

$9^{-\frac{1}{2}}$

$\sqrt{9} = 3, \text{ then } 1 \text{ over it}$

Answer $\frac{1}{3}$

11

A cube has a volume of $\frac{8}{27} \text{ m}^3$.
Find the area of one face.

edge = $(\frac{8}{27})^{\frac{1}{3}} = \frac{2}{3}$

Answer $\frac{4}{9} \text{ m}^2$

12

Write in order, smallest first.

$49^{\frac{1}{2}}, 4^{-\frac{1}{2}}, 27^{\frac{2}{3}}, 32^{\frac{2}{5}}$

Order $4^{-\frac{1}{2}}, 32^{\frac{2}{5}}, 49^{\frac{1}{2}}, 27^{\frac{2}{3}}$

13

Find the value of x .

$8^x = 4$

$8 = 2^3, 4 = 2^2$

Answer $x = \frac{2}{3}$

14

The value, £ V , of a machine t years after it is bought is given by the formula below. Find its value after 3 years.

$V = 6400 \times 4^{-\frac{t}{2}}$

$4^{-\frac{3}{2}} = \frac{1}{8}$

Answer £800

15

The number of bacteria, N , after t hours is given by the formula below. After how many minutes are there 800 bacteria?

$N = 100 \times 4^t$

$4^t = 8, t = \frac{3}{2} \text{ hours}$

Answer 90 minutes

16

Amy says this number is negative because the power is negative. Is Amy right? Explain.

$16^{-\frac{1}{2}}$

1 over $\sqrt{16}$

Answer No, it is $\frac{1}{4}$