



# Fractional Indices



REVISE THIS TOPIC



1 (a) Write down the value of  $9^{\frac{1}{2}}$  [1 mark]

\_\_\_\_\_

Answer \_\_\_\_\_ 3 \_\_\_\_\_

1 (b) Write down the value of  $64^{\frac{1}{2}}$  [1 mark]

\_\_\_\_\_

Answer \_\_\_\_\_ 8 \_\_\_\_\_

1 (c) Write down the value of  $27^{\frac{1}{3}}$  [1 mark]

\_\_\_\_\_

Answer \_\_\_\_\_ 3 \_\_\_\_\_

1 (d) Write down the value of  $10000^{\frac{1}{4}}$  [1 mark]

\_\_\_\_\_

Answer \_\_\_\_\_ 10 \_\_\_\_\_

1 (e) Write down the value of  $8^{\frac{1}{3}}$  [1 mark]

\_\_\_\_\_

Answer \_\_\_\_\_ 2 \_\_\_\_\_

1 (f) Write down the value of  $32^{\frac{1}{5}}$  [1 mark]

\_\_\_\_\_

Answer \_\_\_\_\_ 2 \_\_\_\_\_





2 (a) Write down the value of  $4^{\frac{3}{2}}$  [1 mark]

Answer 8

2 (b) Write down the value of  $64^{\frac{2}{3}}$  [1 mark]

Answer 16

2 (c) Write down the value of  $16^{\frac{3}{4}}$  [1 mark]

Answer 8

2 (d) Write down the value of  $1000^{\frac{5}{3}}$  [1 mark]

Answer 100 000

2 (e) Write down the value of  $25^{\frac{3}{2}}$  [1 mark]

Answer 125

2 (f) Write down the value of  $1^{\frac{4}{5}}$  [1 mark]

Answer 1





3 (a) Work out the value of  $\left(\frac{4}{25}\right)^{\frac{3}{2}}$  [2 marks]

\_\_\_\_\_  
\_\_\_\_\_  
Answer  $\frac{8}{125}$

3 (b) Work out the value of  $\left(\frac{8}{125}\right)^{\frac{1}{3}}$  [2 marks]

\_\_\_\_\_  
\_\_\_\_\_  
Answer  $\frac{2}{5}$

3 (c) Work out the value of  $\left(\frac{8}{27}\right)^{\frac{2}{3}}$  [2 marks]

\_\_\_\_\_  
\_\_\_\_\_  
Answer  $\frac{4}{9}$

3 (d) Work out the value of  $\left(\frac{1}{32}\right)^{\frac{4}{5}}$  [2 marks]

\_\_\_\_\_  
\_\_\_\_\_  
Answer  $\frac{1}{16}$

3 (e) Work out the value of  $\left(\frac{9}{100}\right)^{\frac{3}{2}}$  [2 marks]

\_\_\_\_\_  
\_\_\_\_\_  
Answer  $\frac{27}{1000}$





4 (a)  $36^n = 6$  [1 mark]  
Work out the value of  $n$ .

Answer \_\_\_\_\_

$$\frac{1}{2}$$

4 (b)  $100^n = 1000$  [1 mark]  
Work out the value of  $n$ .

Answer \_\_\_\_\_

$$\frac{3}{2}$$

4 (c)  $8^n = 16$  [1 mark]  
Work out the value of  $n$ .

Answer \_\_\_\_\_

$$\frac{4}{3}$$

4 (d)  $25^n = 125$  [1 mark]  
Work out the value of  $n$ .

Answer \_\_\_\_\_

$$\frac{3}{2}$$

4 (e)  $32^n = 4$  [1 mark]  
Work out the value of  $n$ .

Answer \_\_\_\_\_

$$\frac{2}{5}$$

4 (f)  $400^n = 8000$  [1 mark]  
Work out the value of  $n$ .

Answer \_\_\_\_\_

$$\frac{3}{2}$$





5 (a) Simplify  $(49x^8y^{10})^{\frac{1}{2}}$  [2 marks]

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Answer  $7x^4y^5$

5 (b) Simplify  $(64x^9y^{30})^{\frac{1}{3}}$  [2 marks]

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Answer  $4x^3y^{10}$

5 (c) Simplify  $(125x^3y^{12})^{\frac{2}{3}}$  [2 marks]

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Answer  $25x^2y^8$

5 (d) Simplify  $(a^6b^8c^4)^{\frac{3}{2}}$  [2 marks]

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Answer  $a^9b^{12}c^6$

5 (e) Simplify  $(16m^{20}n^4)^{\frac{1}{4}}$  [2 marks]

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Answer  $2m^5n$





6 (d) Simplify  $\left(\frac{25x^4}{81y^{18}}\right)^{\frac{1}{2}}$  [3 marks]

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

$$\frac{5x^2}{9y^9}$$

6 (d) Simplify  $\left(\frac{8p^3}{27q^{21}}\right)^{\frac{1}{3}}$  Answer \_\_\_\_\_ [3 marks]

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

$$\frac{2p}{3q^7}$$

6 (d) Simplify  $\left(\frac{a^6b^3}{125m^9n^{30}}\right)^{\frac{2}{3}}$  Answer \_\_\_\_\_ [4 marks]

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

$$\frac{a^4b^2}{25m^6n^{20}}$$

6 (d) Simplify  $\left(\frac{16k^{100}}{81x^{16}y^{32}}\right)^{\frac{3}{4}}$  Answer \_\_\_\_\_ [4 marks]

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

$$\frac{8k^{75}}{27x^{12}y^{24}}$$

