



# Fractional Indices



REVISE THIS TOPIC



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

3  
-----  
(1)

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

8  
-----  
(1)

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

3  
-----  
(1)

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

10  
-----  
(1)

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

2  
-----  
(1)

(f) Write down the value of  $16^{\frac{1}{2}}$

4  
-----  
(1)

(g) Write down the value of  $32^{\frac{1}{5}}$

2  
-----  
(1)

(Total for Question 1 is 7 marks)





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

8

(1)

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

16

(1)

(c) Write down the value of  $16^{\frac{3}{4}}$

8

(1)

(d) Write down the value of  $1000^{\frac{5}{3}}$

100 000

(1)

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

125

(1)

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

1

(1)

(g) Write down the value of  $32^{\frac{3}{5}}$

8

(1)

(5) Write down the value of  $81^{\frac{3}{4}}$

27

(1)

(Total for Question 2 is 8 marks)





3 (a) Find the value of  $\left(\frac{4}{25}\right)^{\frac{3}{2}}$

$$\frac{8}{125}$$

(2)

(b) Find the value of  $\left(\frac{8}{125}\right)^{\frac{1}{3}}$

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

(2)

(c) Find the value of  $\left(\frac{8}{27}\right)^{\frac{2}{3}}$

$$\frac{4}{9}$$

(2)

(d) Find the value of  $\left(\frac{1}{32}\right)^{\frac{4}{5}}$

$$\frac{1}{16}$$

(2)

(e) Find the value of  $\left(\frac{9}{100}\right)^{\frac{3}{2}}$

$$\frac{27}{1000}$$

(2)

(Total for Question 3 is 10 marks)





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

$$n = \frac{1}{2} \dots\dots\dots (1)$$

(b)  $100^n = 1000$   
Work out the value of  $n$ .

$$n = \frac{3}{2} \dots\dots\dots (1)$$

(c)  $8^n = 16$   
Work out the value of  $n$ .

$$n = \frac{4}{3} \dots\dots\dots (1)$$

(d)  $25^n = 125$   
Work out the value of  $n$ .

$$n = \frac{3}{2} \dots\dots\dots (1)$$

(e)  $125^n = 25$   
Work out the value of  $n$ .

$$n = \frac{2}{3} \dots\dots\dots (1)$$

(f)  $32^n = 4$   
Work out the value of  $n$ .

$$n = \frac{2}{5} \dots\dots\dots (1)$$

(g)  $81^n = 9$   
Work out the value of  $n$ .

$$n = \frac{1}{2} \dots\dots\dots (1)$$

(h)  $400^n = 8000$   
Work out the value of  $n$ .

$$n = \frac{3}{2} \dots\dots\dots (1)$$

(Total for Question 4 is 8 marks)





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

$$\frac{7x^4y^5}{(2)}$$

(b) Simplify  $(64x^9y^{30})^{\frac{1}{3}}$

$$\frac{4x^3y^{10}}{(2)}$$

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

$$\frac{25x^2y^8}{(2)}$$

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

$$\frac{a^9b^{12}c^6}{(2)}$$

(e) Simplify  $(16m^{20}n^4)^{\frac{1}{4}}$

$$\frac{2m^5n}{(2)}$$

(Total for Question 5 is 10 marks)





6 (a) Simplify  $\left(\frac{25x^4}{81y^{18}}\right)^{\frac{1}{2}}$

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

(3)

(b) Simplify  $\left(\frac{8p^3}{27q^{21}}\right)^{\frac{1}{3}}$

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

(3)

(c) Simplify  $\left(\frac{a^6b^3}{125m^9n^{30}}\right)^{\frac{2}{3}}$

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

(4)

(d) Simplify  $\left(\frac{16k^{100}}{81x^{16}y^{32}}\right)^{\frac{3}{4}}$

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

(4)

(Total for Question 6 is 14 marks)

