

Examples



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Workout

Question 1: Evaluate each of the following

(a)  $25^{\frac{1}{2}}$  (b)  $81^{\frac{1}{2}}$  (c)  $4^{\frac{1}{2}}$  (d)  $144^{\frac{1}{2}}$  (e)  $8^{\frac{1}{3}}$  (f)  $125^{\frac{1}{3}}$

(g)  $100^{\frac{1}{2}}$  (h)  $1000^{\frac{1}{3}}$  (i)  $49^{\frac{1}{2}}$  (j)  $225^{\frac{1}{2}}$  (k)  $64^{\frac{1}{2}}$  (l)  $27^{\frac{1}{3}}$

(m)  $216^{\frac{1}{3}}$  (n)  $64^{\frac{1}{3}}$  (o)  $16^{\frac{1}{4}}$  (p)  $1^{\frac{1}{4}}$  (q)  $81^{\frac{1}{4}}$  (r)  $625^{\frac{1}{4}}$

Question 2: Write each of the following in index form

(a)  $\sqrt{x}$  (b)  $\sqrt{y}$  (c)  $\sqrt[3]{a}$  (d)  $\sqrt[4]{y}$  (e)  $\sqrt[6]{x}$  (f)  $\sqrt[8]{c}$

Question 3: Evaluate each of the following

(a)  $9^{\frac{3}{2}}$  (b)  $4^{\frac{3}{2}}$  (c)  $8^{\frac{2}{3}}$  (d)  $27^{\frac{2}{3}}$  (e)  $125^{\frac{2}{3}}$  (f)  $49^{\frac{3}{2}}$

(g)  $4^{\frac{5}{2}}$  (h)  $64^{\frac{2}{3}}$  (i)  $9^{\frac{5}{2}}$  (j)  $100^{\frac{3}{2}}$  (k)  $16^{\frac{3}{2}}$  (l)  $1000^{\frac{2}{3}}$

(m)  $100^{\frac{5}{2}}$  (n)  $32^{\frac{2}{5}}$  (o)  $4^{\frac{7}{2}}$  (p)  $8^{\frac{5}{3}}$  (q)  $16^{\frac{3}{4}}$  (r)  $81^{\frac{3}{4}}$

(s)  $32^{\frac{3}{5}}$  (t)  $27^{\frac{5}{3}}$  (u)  $64^{\frac{5}{6}}$  (v)  $10000^{\frac{3}{4}}$

Question 4: Write each of the following in index form

(a)  $\sqrt{a^3}$  (b)  $\sqrt{w^5}$  (c)  $\sqrt[3]{x^2}$  (d)  $\sqrt[3]{w^4}$  (e)  $\sqrt[5]{m^2}$  (f)  $\sqrt[9]{k^4}$

Question 5: Write each of the following in the form  $9^n$

(a) 81 (b) 3 (c) 27

Question 6: Write each of the following in the form  $64^n$

(a) 8 (b) 4 (c) 16

Question 7: Simplify each of the following

(a)  $(9x^2)^{\frac{1}{2}}$  (b)  $(4x^6)^{\frac{1}{2}}$  (c)  $(25x^8)^{\frac{1}{2}}$  (d)  $(4x^3)^{\frac{1}{2}}$  (e)  $(8x^3)^{\frac{1}{3}}$  (f)  $(125x^6)^{\frac{1}{3}}$

Question 8: Evaluate each of the following

(a)  $(64x^3)^{\frac{2}{3}}$  (b)  $(9x^4)^{\frac{3}{2}}$  (c)  $(27x^6)^{\frac{2}{3}}$  (d)  $(4x^6)^{\frac{5}{2}}$  (e)  $(16x^8)^{\frac{3}{4}}$  (f)  $(32x^{20})^{\frac{3}{5}}$

Question 9: Write each of the following as fractions

(a)  $8^{-\frac{2}{3}}$  (b)  $25^{-\frac{3}{2}}$  (c)  $64^{-\frac{2}{3}}$  (d)  $4^{-\frac{5}{2}}$  (e)  $81^{-\frac{3}{4}}$  (f)  $100000^{-\frac{2}{5}}$

## Apply

Question 1: Arrange the following in order, smallest first.

$$25^{\frac{1}{2}}, 8^{\frac{2}{3}}, 27^{\frac{1}{3}}$$

Question 2: Which is the odd one out?  
Explain your answer.

$$64^{\frac{1}{2}}, 16^{\frac{3}{4}}, 9^{\frac{2}{3}}, 4^{\frac{3}{2}}$$

Question 3: Work out

(a)  $64^{\frac{1}{3}} \times 2^3$  (b)  $27^{\frac{2}{3}} \div 9^{\frac{3}{2}}$  (c)  $(8^{\frac{2}{3}})^2$

Question 4: Gina has completed her homework.  
Can you spot any mistakes?

Question 1

Work out  $9^{\frac{1}{2}}$

4.5

Question 2

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

18

## Answers



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