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) $81^{\frac{1}{3}}$  (r) $625^{\frac{1}{4}}$

Question 2: Write each of the following in index form
(a) $\sqrt{x}$  (b) $\sqrt[y]{y}$  (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) $\sqrt[a]{a^3}$  (b) $\sqrt[w]{w^5}$  (c) $\sqrt[x]{x^2}$  (d) $\sqrt[w]{w^4}$  (e) $\sqrt[m]{m^2}$  (f) $\sqrt[k]{k^4}$

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) \((4x^6)^{\frac{5}{3}}\)  
(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.
\(64^{\frac{1}{3}}, 16^{\frac{3}{4}}, 9^{\frac{2}{3}}, 4^{\frac{3}{2}}\)

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?

Answers

Question 1
Work out \(9^{\frac{1}{2}}\)
4.5

Question 2
Work out \(27^{\frac{2}{3}}\)
18

© CORBETTMATHS 2019