

Question 1: Evaluate each of the following

- (a) 5^{-2} $\frac{1}{25}$ (b) 2^{-1} $\frac{1}{2}$ (c) 2^{-3} $\frac{1}{8}$ (d) 4^{-2} $\frac{1}{16}$ (e) 3^{-3} $\frac{1}{27}$ (f) 6^{-1} $\frac{1}{6}$
(g) 10^{-2} $\frac{1}{100}$ (h) 2^{-4} $\frac{1}{16}$ (i) 9^{-2} $\frac{1}{81}$ (j) 3^{-4} $\frac{1}{81}$ (k) 10^{-1} $\frac{1}{10}$ (l) 7^{-2} $\frac{1}{49}$
(m) 2^{-5} $\frac{1}{32}$ (n) 5^{-3} $\frac{1}{125}$ (o) 2^{-6} $\frac{1}{64}$ (p) 10^{-4} $\frac{1}{10000}$ (q) 6^{-3} $\frac{1}{216}$ (r) 10^{-6} $\frac{1}{1000000}$

Question 2: Write each of the following in index form.

- (a) $\frac{1}{5^2}$ 5^{-2} (b) $\frac{1}{3^4}$ 3^{-4} (c) $\frac{1}{8^3}$ 8^{-3} (d) $\frac{1}{4^5}$ 4^{-5} (e) $\frac{1}{10^3}$ 10^{-3} (f) $\frac{1}{2^6}$ 2^{-6}

Question 3: Write each of the following in the form 2^n

- (a) $\frac{1}{2}$ 2^{-1} (b) $\frac{1}{4}$ 2^{-2} (c) $\frac{1}{32}$ 2^{-5} (d) $\frac{1}{8}$ 2^{-3} (e) $\frac{1}{64}$ 2^{-6} (f) $\frac{1}{256}$ 2^{-8}

Question 4: Write each of the following in the form 5^n

- (a) $\frac{1}{125}$ 5^{-3} (b) $\frac{1}{25}$ 5^{-2} (c) $\frac{1}{5}$ 5^{-1} (d) $\frac{1}{3125}$ 5^{-5} (e) $\frac{1}{625}$ 5^{-4} (f) $\frac{1}{15625}$ 5^{-6}

Question 5: Write each of the following as fractions

- (a) a^{-2} $\frac{1}{a^2}$ (b) y^{-1} $\frac{1}{y}$ (c) w^{-4} $\frac{1}{w^4}$ (d) 2^{-x} $\frac{1}{2^x}$ (e) 5^{-a} $\frac{1}{5^a}$ (f) x^{-n} $\frac{1}{x^n}$

Question 6: Write each of the following in index form

- (a) $\frac{1}{w^2}$ w^{-2} (b) $\frac{1}{2^y}$ 2^{-y} (c) $\frac{1}{x^5}$ x^{-5} (d) $\frac{1}{4^x}$ 4^{-x} (e) $\frac{1}{y^x}$ y^{-x} (f) $\frac{1}{m^n}$ m^{-n}

Question 7: Write each of the following as fractions

- (a) $5y^{-2}y^{\frac{5}{2}}$ $\frac{5}{25x^2}$ (b) $8c^{-1}c^{\frac{8}{3}}$ $\frac{1}{8y^3}$ (c) $(5x)^{-2}$ $\frac{1}{25x^2}$ (d) $(2y)^{-3}$ $\frac{1}{8y^3}$ (e) $2x^{-3}$ $\frac{1}{8x^3}$ (f) $(10w)^{-3}$ $\frac{1}{1000w^3}$

Question 8: Write each of the following in index form

(a) $\frac{3}{x^2}$ (b) $\frac{5}{w^8}$ (c) $\frac{2}{3y^2}$ (d) $\frac{1}{4x^3}$ (e) $\frac{6}{y^m}$ (f) $\frac{a}{x^n}$
Handwritten: $3x^{-2}$, $5w^{-8}$, $\frac{2}{3}y^{-2}$, $\frac{1}{4}x^{-3}$, $6y^{-m}$, ax^{-n}

Question 9: Write each of the following as fractions

(a) $100^{-\frac{1}{2}}$ (b) $25^{-\frac{1}{2}}$ (c) $9^{-\frac{1}{2}}$ (d) $8^{-\frac{1}{3}}$ (e) $125^{-\frac{1}{3}}$ (f) $16^{-\frac{1}{4}}$
Handwritten: $\frac{1}{10}$, $\frac{1}{5}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{1}{5}$, $\frac{1}{2}$

Question 10: 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) $10000^{-\frac{2}{5}}$
Handwritten: $\frac{1}{4}$, $\frac{1}{125}$, $\frac{1}{16}$, $\frac{1}{32}$, $\frac{1}{27}$, $\frac{1}{100}$

Apply

Question 1: Arrange in order from smallest to largest.

Handwritten: $\frac{1}{50}, 5^{-2}, 2^{-3}, \frac{3}{10}$

Handwritten: $\frac{1}{50}$, 5^{-2} , $\frac{3}{10}$, 2^{-3}
 $\frac{1}{25}$, $\frac{1}{8}$

Question 2: Work out

(a) $4^{-2} \times 3^2$ (b) $10^{-1} \div 5^{-2}$ (c) $2^{-2} + 3^{-2} \times 2^3$
Handwritten: $\frac{9}{16}$, $\frac{5}{2}$, $\frac{41}{36}$

Question 3: Sally has completed her homework. Can you spot any mistakes?

Question 1
Evaluate

Question 2
Work out

Handwritten: 4^{-2} it should be $\frac{1}{4^2} = \frac{1}{16}$, 10^{-3} , $10^3 = 1000$, $\frac{1}{30}$, $\frac{1}{10^3} = \frac{1}{1000}$, -16

Question 4: Given that $2^m + 2^n = \frac{9}{32}$

Work out mn

Handwritten: 10

Handwritten: $2^{-2} + 2^{-5}$, $\frac{1}{4} + \frac{1}{32}$, $m = -2$, $n = -5$, $-2 \times -5 = 10$, $\frac{8}{32} + \frac{1}{32} = \frac{9}{32}$

Question 5:

$$x^{-2} \quad x^0 \quad x \quad x^3$$

Put the expressions above in order, from smallest to largest, when:

x^{-2}, x^0, x, x^3 All equal x^3, x, x^0, x^{-2} x, x^3, x^0, x^{-2}

(a) $x = 2$ (b) $x = 1$ (c) $x = 0.5$ (d) $x = 0$ (e) $x = -0.5$

(f) $x = -1$ (g) $x = -2$

x, x^3, x^{-2}, x^0 x^0, x^2, x^3 x^3, x, x^{-2}, x^0

