

Do not leave any negative exponents or decimals in your final answers.

1. Evaluate.

$$\begin{aligned} \text{a) } 6^{-2} \\ = \frac{1}{6^2} \end{aligned}$$

$$\text{a) } \underline{\frac{1}{36}}$$

$$\begin{aligned} \text{b) } (-4)^{-3} \\ = \frac{1}{(-4)^3} \end{aligned}$$

$$\text{b) } \underline{-\frac{1}{64}}$$

$$\begin{aligned} \text{c) } \left(\frac{4}{9}\right)^{-1} \\ = \frac{9}{4} \end{aligned}$$

$$\text{c) } \underline{\frac{9}{4}}$$

$$\begin{aligned} \text{d) } \left(\frac{1}{5}\right)^{-4} \\ = 5^4 \end{aligned}$$

$$\text{d) } \underline{625}$$

$$\begin{aligned} \text{e) } 0.5^{-3} \\ = \left(\frac{1}{2}\right)^{-3} \\ = 2^3 \end{aligned}$$

$$\text{e) } \underline{8}$$

$$\begin{aligned} \text{f) } \frac{1}{4^{-2}} \\ = 4^2 \end{aligned}$$

$$\text{f) } \underline{16}$$

2. Simplify by writing as a single power.

$$\begin{aligned} \text{a) } 0.6^4 \cdot 0.6^{-7} \\ = 0.6^{-3} \\ = \left(\frac{6}{10}\right)^{-3} \\ = \left(\frac{5}{3}\right)^3 \end{aligned}$$

$$\text{a) } \underline{\left(\frac{5}{3}\right)^3}$$

$$\begin{aligned} \text{b) } \left[\left(-\frac{4}{5}\right)^2 \right]^{-3} \div \left[\left(-\frac{4}{5}\right)^4 \right]^{-5} \\ = \left(-\frac{4}{5}\right)^{-6} \div \left(-\frac{4}{5}\right)^{-20} \\ = \left(-\frac{4}{5}\right)^{14} \end{aligned}$$

$$\text{b) } \underline{\left(-\frac{4}{5}\right)^{14}}$$

$$\begin{aligned} \text{c) } \frac{9^{5/3} \cdot 9^{-1/3}}{9^{1/3}} \\ = \frac{9^{4/3}}{9^{1/3}} \\ = 9^{3/3} \end{aligned}$$

$$\text{c) } \underline{9^1}$$

3. Simplify each expression, then evaluate:

$$\begin{aligned} \text{a) } & \left(\frac{3}{2}\right)^{\frac{3}{2}} \left(\frac{3}{2}\right)^{\frac{1}{2}} \\ & = \left(\frac{3}{2}\right)^{4/2} \\ & = \left(\frac{3}{2}\right)^2 \end{aligned}$$

$$\begin{aligned} \text{b) } & \frac{(-5)^{\frac{2}{3}}}{(-5)^{-\frac{4}{3}}} \\ & = (-5)^{6/3} \\ & = (-5)^2 \end{aligned}$$

$$\begin{aligned} \text{c) } & \left[\left(\frac{-12}{5}\right)^{\frac{1}{3}}\right]^6 \\ & = \left(-\frac{12}{5}\right)^2 \end{aligned}$$

$$\begin{aligned} \text{d) } & \frac{0.2^{\frac{3}{4}}}{0.2^{\frac{7}{4}}} \\ & = (0.2)^{-4/4} \\ & = \left(\frac{2}{10}\right)^{-1} \\ & = \left(\frac{10}{2}\right)^1 \end{aligned}$$

$$\text{a) } \underline{\frac{9}{4}}$$

$$\text{b) } \underline{25}$$

$$\text{c) } \underline{\frac{144}{25}}$$

$$\text{d) } \underline{5}$$

4. Simplify.

$$\begin{aligned} \text{a) } & m^4 n^{-2} \cdot m^2 n^3 \\ & = m^6 n^1 \end{aligned}$$

$$\begin{aligned} \text{b) } & \frac{6x^4 y^{-3}}{14xy^2} \\ & = \frac{3x^3 y^{-5}}{7} \end{aligned}$$

$$\begin{aligned} \text{c) } & (a^4 b^2)^{3/2} \\ & = a^6 b^3 \end{aligned}$$

$$\text{a) } \underline{m^6 n}$$

$$\text{b) } \underline{\frac{3x^3}{7y^5}}$$

$$\text{c) } \underline{a^6 b^3}$$

$$\begin{aligned} \text{d) } & (x^3 y^{-3/2})(x^{-1} y^{1/2}) \\ & = x^2 y^{-2/2} \\ & = x^2 y^{-1} \end{aligned}$$

$$\begin{aligned} \text{e) } & \frac{12x^{-5/2} y^{7/2}}{3x^{1/2} y^{-1/2}} \\ & = 4x^{-6/2} y^{8/2} \\ & = 4x^{-3} y^4 \end{aligned}$$

$$\begin{aligned} \text{f) } & \left(\frac{x^2 y^4}{x^4 y^8}\right)^{1/2} \\ & = (x^{-2} y^{-4})^{1/2} \\ & = x^{-1} y^{-2} \end{aligned}$$

$$\text{d) } \underline{\frac{x^2}{y}}$$

$$\text{e) } \underline{\frac{4y^4}{x^3}}$$

$$\text{f) } \underline{\frac{1}{xy^2}}$$