

Powers Review

Answer Key.

1. Write $186^{4/5}$ as a radical. $\sqrt[5]{186^4}$
2. Write $\sqrt[8]{\left(\frac{684}{15}\right)^{11}}$ as a power. $\left(\frac{684}{15}\right)^{11/8}$
3. Evaluate $0.09^{1/2}$ without using a calculator. (Express as a radical and then evaluate)
4. Evaluate $(-8)^{1/3}$ without using a calculator. (Express as a radical and then evaluate)
5. Evaluate $\left(\frac{16}{625}\right)^{1/4}$ without using a calculator. (Express as a radical and then evaluate)

$$\begin{aligned} \textcircled{3} \left(\frac{9}{100}\right)^{1/2} &= \sqrt{\frac{9}{100}} \\ &= \frac{3}{10} \end{aligned} \quad \left\{ \begin{aligned} \textcircled{4} (-8)^{-1/3} &= \frac{1}{(-8)^{1/3}} \\ &= \frac{1}{\sqrt[3]{-8}} \\ &= \frac{1}{-2} \end{aligned} \right.$$

9. Simplify $x^{-2}y^6 \cdot x^3y^8$. Write using powers with positive exponents. $= \frac{1}{8} \mid \frac{21}{8}$

$$x^1y^{-2} = \frac{x}{y^2}$$

10. Simplify $\frac{12p^3q^{-7}}{15pq^6}$. Write using powers with positive exponents.

$$\frac{4p^2q^{-13}}{5q^{13}} = \frac{4p^2}{5q^{13}}$$

11. Evaluate $\left(\frac{8}{5}\right)^{\frac{7}{4}} \cdot \left(\frac{8}{5}\right)^{\frac{1}{4}}$

$$\left(\frac{8}{5}\right)^{\frac{8}{4}} = \left(\frac{8}{5}\right)^2 = \frac{64}{25}$$

12. Simplify $\frac{(5b^7)^3}{(2a^3)^4} = \frac{5^3 b^{21}}{2^4 a^{12}}$

13. Simplify $\frac{(m^3n^{-3})^{-1}}{(m^{-2}n)^4} = \frac{m^{-3}n^3}{m^{-8}n^4} = \frac{m^5n^{-1}}{1} = \frac{m^5}{n}$

13. Simplify $\frac{(m^3 n^{-3})^{-1}}{(m^{-2} n)^4} = \frac{m^{-3} n^3}{m^{-8} n^4} = \frac{m^5 n^{-1}}{1} = \frac{m^5}{n}$

Evaluate:

a) $2401^{3/4}$
 $\sqrt[4]{2401}^3$
 7^3
 343

b) $32^{-0.4}$
 $= 32^{-4/10}$
 $= 32^{-2/5}$
 $= \frac{1}{32^{2/5}}$
 $= \frac{1}{2^5 \cdot 32^2}$
 $= \frac{1}{2^2} = 1/4$

Simplify:

a) $\left(\frac{(6x^8 y^{-3} \cdot x^{11} y^3)}{(2xy^7)}\right)^{-2}$
 $\left(\frac{6x^{19} y^0}{2xy^7}\right)^{-2}$
 $(3x^{18} y^{-7})^{-2}$
 $\frac{3^{-2} x^{-36} y^{14}}{1} = \frac{4}{3^2 x^{36}}$

b) $\left(\frac{5^6 x^3 y^5}{5x^{-2} y^3}\right)^3$
 $(5^5 x^5 y^2)^3$
 $5^{15} x^{15} y^6$