

Exponent Practice

Monday, September 23, 2019 7:46 AM

$$\begin{aligned} &(x^{-2}x^{-3})^4 \\ &(x^{-5})^4 \\ &(x^{-20}) \\ &\boxed{\frac{1}{x^{20}}} \end{aligned}$$

$$\begin{aligned} &(x^4)^{-3} \cdot 2x^4 \\ &(x^{-12}) \cdot 2x^4 \\ &2 \cdot x^{-8} \\ &\boxed{\frac{2}{x^8}} \end{aligned}$$

$$\begin{aligned} &\frac{2x^4y^{-4}z^{-3}}{3x^2y^{-3}z^4} \\ &\frac{2}{3} \cdot \frac{x^4}{x^2} \cdot \frac{y^{-4}}{y^{-3}} \cdot \frac{z^{-3}}{z^4} \\ &\frac{2}{3} \cdot \frac{x^2}{1} \cdot \frac{y^{-1}}{1} \cdot \frac{1}{z^7} \\ &\frac{2}{3} \cdot \frac{x^2}{1} \cdot \frac{1}{y} \cdot \frac{1}{z^7} \\ &\boxed{\frac{2x^2}{3yz^7}} \end{aligned}$$

$$\begin{aligned} &\frac{3x^3y^{-1}z^{-1}}{x^{-4}y^0z^0} \\ &\frac{3}{1} \cdot \frac{x^3}{x^{-4}} \cdot \frac{y^{-1}}{y^0} \cdot \frac{z^{-1}}{z^0} \\ &\frac{3}{1} \cdot \frac{x^7}{1} \cdot \frac{1}{y} \cdot \frac{1}{z} \\ &\boxed{\frac{3x^7}{yz}} \end{aligned}$$

$$\frac{3x^2y^2}{2x^{-1} \cdot 4yx^2} \quad \frac{3x^2y^2}{8xy}$$

$$\frac{3}{8} \cdot \frac{x^2}{x} \cdot \frac{y^2}{y}$$

$$\frac{3}{8} \cdot \frac{x}{1} \cdot \frac{y}{1}$$

$$\boxed{\frac{3xy}{8}}$$

$$\frac{2x^2y^4 \cdot 4x^2y^4 \cdot 3x}{3x^{-3}y^2}$$

$$\frac{24x^5y^8}{3x^{-3}y^2}$$

$$\frac{24}{3} \cdot \frac{x^5}{x^{-3}} \cdot \frac{y^8}{y^2}$$

$$\frac{8}{1} \cdot \frac{x^8}{1} \cdot \frac{y^6}{1}$$

$$\boxed{8x^8y^6}$$

$$\frac{(2hj^2k^{-2} \cdot h^4j^{-1}k^4)^0}{2h^{-3}j^{-4}k^{-2}}$$

$$\frac{1}{2h^{-3}j^{-4}k^{-2}}$$

$$\boxed{\frac{h^3y^4k^2}{2}}$$

Solve (a) $5^x = 125$, (b) $4^x = 2^{x-3}$, and (c) $9^{x+2} = 27^x$.

$$a) 5^x = 125$$

$$b) 4^x = 2^{x-3}$$

$$c) 9^{x+2} = 27^x$$

$$\begin{aligned} \text{a) } 5^x &= 125 \\ 5^x &= 5^3 \\ \boxed{x=3} \end{aligned}$$

$$\begin{aligned} \text{b) } 4^x &= 2^{x-3} \\ (2^2)^x &= 2^{x-3} \\ 2^{2x} &= 2^{x-3} \\ 2x &= x-3 \\ \boxed{x=-3} \end{aligned}$$

$$\begin{aligned} \text{c) } 9^{x+2} &= 27^x \\ (3^2)^{x+2} &= (3^3)^x \\ 3^{2x+4} &= 3^{3x} \\ 2x+4 &= 3x \\ \boxed{4=x} \end{aligned}$$

Solve the equation. Check your solution.

$$1. \underline{2}^{2x} = \underline{2}^6$$

$$\begin{aligned} 2x &= 6 \\ \boxed{x=3} \end{aligned}$$

$$2. \underline{5}^{2x} = \underline{5}^{x+1}$$

$$\begin{aligned} 2x &= x+1 \\ \boxed{x=1} \end{aligned}$$

$$3. \underline{7}^{3x+5} = \underline{7}^{x+1}$$

$$\begin{aligned} 3x+5 &= x+1 \\ 2x &= -4 \\ \boxed{x=-2} \end{aligned}$$

Solve the equation. Check your solution.

$$4. 4^x = 256$$

$$\begin{aligned} 4^x &= 4^4 \\ \boxed{x=4} \end{aligned}$$

$$5. 9^{2x} = 3^{x-6}$$

$$\begin{aligned} (3^2)^{2x} &= 3^{x-6} \\ 3^{4x} &= 3^{x-6} \\ \dots \end{aligned}$$

$$6. 4^{3x} = 8^{x+1}$$

$$\begin{aligned} (2^2)^{3x} &= (2^3)^{x+1} \\ 2^{6x} &= 2^{3x+3} \\ \therefore x &= 3x+3 \end{aligned}$$

$$7. \left(\frac{1}{3}\right)^{x-1} = 27$$

$$\begin{aligned} (3^{-1})^{x-1} &= 3^3 \\ 3^{-x+1} &= 3^3 \end{aligned}$$



$$4x = x - 6$$

$$3x = -6$$

$$\boxed{x = -2}$$

$$6x = 3x + 3$$

$$3x = 3$$

$$\boxed{x = 1}$$

$$5 \quad - \quad -$$

$$-x + 1 = 3$$

$$-x = 2$$

$$\boxed{x = -2}$$

$$6^{x+1} = 6^5$$

$$x+1 = 5$$

$$\boxed{x = 4}$$

$$4^{3x-9} = 16$$

$$4^{3x-9} = 4^2$$

$$3x-9 = 2$$

$$3x = 11$$

$$\boxed{x = \frac{11}{3}}$$

$$3^{4x-5} = 81$$

$$3^{4x-5} = 3^4$$

$$4x-5 = 4$$

$$4x = 9$$

$$\boxed{x = \frac{9}{4}}$$

$$12^{\frac{1}{2}x+7} = 144$$

$$12^{\frac{1}{2}x+7} = 12^2$$

$$\frac{1}{2}x+7 = 2$$

$$\frac{x}{2} + 7 = 2$$

$$\frac{x}{2} = -5$$

$$\underline{\underline{x = -10}}$$

$$\boxed{x = 4}$$

$$\frac{x}{2} = -5$$
$$\boxed{x = -10}$$

$$216^{5x+8} = 1296^{2x-3}$$

$$(6^3)^{5x+8} = (6^4)^{2x-3}$$

$$6^{15x+24} = 6^{8x-12}$$

$$15x+24 = 8x-12$$

$$7x = -36$$

$$\boxed{x = \frac{-36}{7}}$$