

Exponents

$$x^5 x^3 = x^{5+3} = x^8$$

Add the Exponents.

$$x^{a+b}$$

$$1$$

$$x^0 = 1$$

$$\frac{x^5}{x^3} = x^{5-3} = x^2$$

Subtract the Exponents.

$$x^{a-b}$$

Positive

$$(x^5)^3 = x^{5 \cdot 3} = x^{15}$$

Multiply the Exponents.

$$x^{a \cdot b}$$

$$\frac{1}{x^a}$$

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

$$(x^5 y^2)^3 = x^{5 \cdot 3} y^{2 \cdot 3} = x^{15} y^6$$

$$x^{ac} y^{bc}$$

$$x^a$$

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

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

$$\frac{x^{ac}}{y^{bc}}$$

$$\frac{y^a}{x^a}$$

$$\left(\frac{x}{y}\right)^{-2} = \frac{y^2}{x^2}$$

Zero Exponent

$$x^0$$

To be simplified all exponents must be _____.

Negative Exponent

$$x^{-a}$$

Negative Exponent

$$\frac{1}{x^{-a}}$$

Negative Exponent

$$\left(\frac{x}{y} \right)^{-a}$$

$$\textcircled{1} (3x^2y^4)(10x^3y)$$

$$30x^5y^5$$

$$\textcircled{2} (-x^5y^3)(3x^2y)$$

$$-3x^7y^4$$

$$\textcircled{3} (x^5y)^3$$

$$x^{15}y^3$$

$$\textcircled{4} (3x^2y^4)^4$$

$$3^4x^8y^{16}$$

$$81x^8y^{16}$$

$$\textcircled{5} \frac{x^9y^5}{x^8y^3}$$

$$xy^2$$

$$\textcircled{6} \frac{10x^{10}y^5}{2x^2y^5}$$

$$5x^8$$

$$\textcircled{7} \frac{x^9y^3}{x^{10}y^4}$$

$$x^{-1}y^{-1}$$

$$\frac{1}{xy}$$

$$\textcircled{8} (5x^2y^3)^2(x^4y)$$

$$5^2x^4y^6(x^4y)$$

$$25x^8y^7$$

$$\textcircled{9} \frac{(x^4y^5)^2}{x^{-3}y^{-2}} = \frac{x^8y^{10}}{x^{-3}y^{-2}} = x^{11}y^{12}$$

$$\textcircled{10} \left(\frac{x^3y^4}{z^{10}} \right)^0 = 1$$

u

Multiply Powers

$$x^a x^b$$

Divide Powers

$$\frac{x^a}{x^b}$$

Power to a Power

$$(x^a)^b$$

Power of a Product

$$(x^a y^b)^c$$

Power of a Quotient

$$\left(\frac{x^a}{y^b} \right)^c$$