

Raising Exponents to a Power

RULE: $(x^a)^b = x^{ab}$

Multiply the following polynomials.

1. $(xy^3)(x^3y)$ x^4y^4

2. $(7xy^3)(-5x^3y^2)$ $-35x^4y^5$

3. $(x^3y^3)^3$ x^9y^9

4. $(-4x^3y^3)^4$ $256x^{12}y^{12}$

5. $(6x^5y^4)^3$ $216x^{15}y^{12}$

6. $(x^2y^3)(x^3y^2)$ x^5y^5

Dividing Exponents

Rule: $\frac{x^a}{x^b} = x^{a-b}$

Divide the following polynomials.

1. $\frac{18c^3}{-3c^2}$ $-6c$ 4. $\frac{28x^2y}{-4x^2}$ $-7y$

2. $\frac{-48c^2d^4}{-8cd}$ $6cd^3$ 5. $\frac{-3p^8}{6p^2}$ $-\frac{1p^6}{2}$

3. $\frac{22v^5z^8}{2yz^7}$ $11y^4z$ 6. $\frac{42r^{13}}{-7r^8}$ $-6r^5$

Multiplying Exponents

Rule: $x^a \cdot x^b = x^{a+b}$

Multiply the following polynomials.

1. $a \cdot a^2 \cdot a^3 = a^6$

2. $(2a^2b)(4ab^2) = 8a^3b^3$

3. $(6x^2)(-3x^5) = -18x^7$

4. $b^3 \cdot b^4 \cdot b^7 \cdot b = b^{15}$

5. $(3x^3)(3x^4)(-3x^2) = -27x^9$

6. $(4c^2)(-8c^7) = -32c^9$

Negative Exponents

Rule: $x^{-a} = \frac{1}{x^a}$

Simplify the following.

1. a^{-6} $\frac{1}{a^6}$ 4. $-2x^{-3}$ $-\frac{2}{x^3}$

2. m^2n^{-2} $\frac{m^2}{n^2}$ 5. $(-11x^3y)^{-2}$ $\frac{1}{121x^6y^2}$

3. $3a^2b^{-3}$ $\frac{3a^2}{b^3}$ 6. $(-3)^{-3}$ $\frac{1}{(-3)^3} = -\frac{1}{27}$