

SIMPLIFY. EXPRESS USING EXPONENTS (Multiplication: Add exponents)

1.) $x^4 \cdot x^9$

x^{13}

2.) $x^4 \cdot x^7 \cdot x^3$

x^{14}

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

$15x^5 y^3$

SIMPLIFY. EXPRESS USING EXPONENTS (Division: Subtract exponents)

1.) $\frac{x^8}{x^6}$

x^2

2.) $\frac{x^9 y^5}{x^4 y^4}$

$x^5 y^1$

3.) $\frac{8^7 x^8 y^5}{8^3 x^6 y^4}$

$8^4 x^2 y^1$

EXPRESS USING POSITIVE EXPONENTS

1.) x^{-21}

$\frac{1}{x^{21}}$

2.) $7x^{-4}$

$\frac{7}{x^4}$

3.) $(xy)^{-1}$

$\frac{1}{(xy)^1}$

SIMPLIFY.

1.) -17^0

1

2.) 123^0

1

3.) 659532^0

1

SIMPLIFY. (Power to a power: Multiply exponents)

$$\begin{array}{lll} 1.) (8y^9)^2 & 2.) (5x^7y^3z^2)^6 & 3.) \left(\frac{x^5}{y^8}\right)^4 \\ 8^2y^{18} & 5^6x^{42}y^{18}z^{12} & \frac{x^{20}}{y^{32}} \end{array}$$

SIMPLIFY. (Multiplication: Multiply numbers, keep bases, add exponents)

$$\begin{array}{ll} 1.) (7p^4q^9)(6p^3q^5) & 2.) (5x^8)(6x^3)(x^5) \\ 42p^7q^{14} & 30x^{16} \end{array}$$

SIMPLIFY. (Divide: Divide numbers, keep bases, subtract exponents)

$$\begin{array}{ll} 1.) \frac{-7x^8y^{10}}{-7x^4y^3} & 2.) \frac{-36x^{19}y^{25}}{6x^{15}y^{17}} \\ x^4y^7 & -6x^4y^8 \end{array}$$

SCIENTIFIC → STANDARD (Positive exponent: Move decimal to right. Negative exponent: Move decimal to left.)

$$\begin{array}{ll} 1.) 5.2 \times 10^4 & 2.) 3.14 \times 10^{-7} \\ 52000 & 0.000000314 \end{array}$$

STANDARD → SCIENTIFIC (Numbers bigger than 1 gets positive exponent.

Numbers smaller than 1 get a negative exponent.)

1.) 158800

$$1.588 \times 10^5$$

2.) 0.0007006

$$7.006 \times 10^{-4}$$

IDENTIFY THE TERMS. GIVE THE COEFFICIENT OF EACH.

1.) $3b^4 - ab^2 - 2b^5 + 7ab$

TERMS: $3b^4, -ab^2, -2b^5, 7ab$

COEFF.: $3, -1, -2, 7$

2.) $5xy^2 - 6xy^5 + 8x^6 - x^6y^3$

$5xy^2, -6xy^5, 8x^6, -x^6y^3$

TERMS:

COEFF.: $5, -6, 8, -1$

COLLECT LIKE TERMS AND ARRANGE IN DESCENDING ORDER FOR X. (BIG SMALL)

1.) $-5x^2y + \underline{xy} - 3xy - \underline{xy} + 2x^2y$

$$-3x^2y - 3xy$$

2.) $6x^7 + 8x^3 - 10x^3 + 7 - 2x^7 + 5x^3 - 3$

$$4x^7 + 3x^3 + 4$$

ADD.

1.) $(-5m^3 - 8m^2 - 5m - 7) + (3m^4 - 9m^2 + 4m - 7)$

$$-5m^3 - 17m^2 - m - 14 + 3m^4$$

$$2.) (-7x^4y^3 - 5xy + 6) + (4x^4y^3 + 2x^2 + 4xy + 10)$$

$$-3x^4y^3 - xy + 16 + 2x^2$$

SUBTRACT.

$$1.) (9x^3 + 6x^2 - 5x - 6) - (7x^3 - 8x^2 + 6)$$

$$2x^3 + 14x^2 - 5x - 12$$

$$2.) (9ab^2 - 10ab + 12a) - (-7ab^2 + 8a + 5)$$

$$16ab^2 - 10ab + 20a - 5$$

MULTIPLY. Multiply numbers, add exponents

1.) $6x(6x^2 - 2x + 5y - 9)$

$$36x^3 - 12x^2 + 30xy - 54x$$

2.) $4a^2(-9a^3 + 3a - 10)$

$$-36a^5 + 12a^3 - 40a^2$$

FOIL.

1.) $(4x + 3)(x - 3)$

$$4x^2 + -12x + 3x - 9$$

$$4x^2 - 9x - 9$$

2.) $(6x^5 + 2x^2)(-4x^3 + 2x)$

$$-24x^8 + 12x^6 - 8x^5 + 4x^3$$