

Warm Up

Simplify.

$$1) \underline{3b^1} \cdot \underline{4b^3}$$

$12b^4$

$$2) (2m^4)^3$$

$$2^3 m^{12}$$

$$8m^{12}$$

Simplify. Your answer should contain only positive exponents.

$$3) \frac{3x^{4-2}}{x^2} \quad 3x^2$$

2-1 Adding and Subtracting Polynomials

Objective: I will be able to add and subtract polynomials.

A polynomial can have constants, variables and exponents, but never division by a variable.

constants (like 3, -20, or $\frac{1}{2}$)

variables (like x and y)

exponents (like the 2 in y^2), but only 0, 1, 2, 3, ... etc are allowed

... **not** division by a variable (so something like $\frac{2}{x}$ is right out)

Polynomial or Not?

exponents: 0,1,2,...

The expression $5xy^2 - 3x + 5y^3 - 3$ is shown. A blue box highlights the entire expression. Yellow lines point from the text 'exponents: 0,1,2,...' to the exponents 2, 1, and 3. Yellow lines also point from the text 'terms' to each of the four terms: $5xy^2$, $-3x$, $5y^3$, and -3 .

A Polynomial

Two expressions are shown, each circled in red with a diagonal slash through it, indicating they are not polynomials. The first expression is $3xy^{-2}$, where the exponent -2 is circled in blue. The second expression is $\frac{2}{x+2}$, where the entire fraction is circled in blue.

Not Polynomials

Add each polynomial by combining like terms.

$$1. (4x+3)+(6x+2)$$

$$\underline{4x} + 3 + \underline{6x} + 2$$

$$10x + 5$$

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

$$\underline{2x} - 3 + 4 - \underline{6x}$$

$$-4x + 1$$

$$3. (2y^2 - 2y + 7) + (y^2 - 11 + 12y)$$

$$\underline{2y^2} - \underline{2y} + 7 + \underline{y^2} - 11 + \underline{12y}$$

$$3y^2 + 10y - 4$$

You try...

1. $(2x+7)+(2x+3)$

$$\begin{aligned} 2x+7+2x+3 \\ 4x+10 \end{aligned}$$

2. $(8x+5)+(-2x-9)$

$$6x-4$$

3. $(8y^2+5-y)+(12y^2+3y-9)$

$$\begin{aligned} & \textcircled{8y^2} + \textcircled{5} + \textcircled{-y} + \textcircled{12y^2} + \textcircled{3y} + \textcircled{-9} \\ & - \\ & 20y^2 - 4 + 2y \end{aligned}$$

$-4 + 20y^2 + 2y$

Subtract each polynomial.

$$1. (4x+3) - (6x+2)$$

$$4x+3-6x-2$$

$$2. (2x-3) - (4-6x)$$

$$2x-3-4+6x$$

$$8x-7$$

$$3. (8y^2+5-y) - (12y^2+3y-9)$$

$$8y^2+5-y-12y^2-3y+9$$

$$-4y^2-4y+14$$

You try? Right now!

$$1. (2x+7)-(2x+3) \quad 2.$$

$$2x+7-2x+3 \quad \begin{array}{l} 2x-2x=0 \\ 7-3=4 \end{array}$$

4

$$7+11$$

$$3. (2y^2-2y+7)-(y^2-11+12y)$$

$$2y^2-2y+7-y^2+11-12y$$

$$y^2+18-14y$$

$$(8x+5)-(-2x-9)$$

$$8x+5+2x+9$$

$$10x+14$$

Be careful! You can only combine like terms.

$$(y^4 - 2y + 6y^2) + (2y^2 - 11y^4 + 12y - 3y^3)$$