

5.3 Intro to Polynomials: Adding & Subtracting Polynomials

Warm Up:

"Add Polynomials" = combine like terms of the polynomials which need to be added

1. Add the polynomials by collecting like terms. Then, simplify.

a) $(3x^2 - 2x) + (x^2 + x)$ b) $(4n^2 - 2n - 4) + (-n^2 + 5n)$ c) $(7r - 8) + (3r^2 - 11)$
 $4x^2 - x$ $3n^2 + 3n - 4$ $3r^2 + 7r - 19$

d) $(2b^2 - 8b) + (-2b^2 + 11b)$ e) $(7t^2 - 6t + 9) + (-2t^2 + 6t - 5)$ f) $(-14k - 10) + (8k - 23)$
 $3b$ $5t^2 + 4$ $-6k - 33$

"Subtract Polynomials" = add the opposite expression of the polynomial that needs to be subtracted. The opposite of a polynomial is found by taking the opposite of each its terms.

Ex: The opposite of $2x^2 - 3x + 7$ is $-2x^2 + 3x - 7$

2. Determine the opposite of each expression.

a) $6a$ $-6a$ b) $-3c^2 - 9$ $3c^2 + 9$
c) $d^2 - 8d + 2$ $-d^2 + 8d - 2$ d) $6w^2 + 4w - 0.8$ $-6w^2 - 4w + 0.8$

3. Subtract the polynomials by adding the opposite terms, collecting like terms, and then simplifying.

a) $(5a - 4) - (3a - 2)$ b) $(7 - 6r) - (3 + r)$
 $5a - 4 + -3a + 2$ $7 - 6r + -3 - r$
 $= 2a - 2$ $= -7r + 4$

c) $(6y^2 - 2y) - (-y^2 - 3y)$ d) $(8 - 5t) - (-9 - 4t)$
 $6y^2 - 2y + y^2 + 3y$ $8 - 5t + 9 + 4t$
 $= 7y^2 + y$ $= -t + 17$

e) $(h - 1) - (3h^2 + 7)$ f) $(4k^2 - 6k + 1) - (-2k^2 + 5)$
 $h - 1 + -3h^2 - 7$ $4k^2 - 6k + 1 + 2k^2 - 5$
 $= -3h^2 + h - 8$ $= 6k^2 - 6k - 4$

4. Simplify and state the degree of your answer

a) $(3x^2y - 2xy^2) + (3yx^2 - 2xy^2)$ $D=3$ b) $-(3x^2 - 2x) - (-2x + 3x^2) + (6x^2 - 4x)$ $D=0$
 $3x^2y - 2xy^2 + 3x^2y - 2xy^2$ $-3x^2 + 2x + 2x - 3x^2 + 6x^2 - 4x$
 $= 6x^2y - 4xy^2$ $= 0$

c) $(g^2h - g^2 + h) - (4hg^2 + 3g^2 - h)$ $D=3$ d) $(7mn - 2n + 3) - (3nm + 4) + (3m - mn)$ $D=2$
 $g^2h - g^2 + h - 4g^2h - 3g^2 + h$ $7mn - 2n + 3 + -3mn - 4 + 3m - mn$
 $= -3g^2h - 4g^2 + 2h$ $= 3mn + 3m - 2n - 1$