Exercise 3. Collecting Similar Terms

Example 1: Simplify: $9x^2 - 7x + 5 + 15x - 14x^2 - 6 + 20x^2 - 40x$.

Collect the coefficients of the like powers.

$(9x^2 - 14x^2 + 20x^2) + (-7x + 15x - 40x) + (5 - 6)$

$15x^2 - 32x - 1$

Simplify.

1. $a^2 - 4b^2 + 7ab - 6b^2 + 2a^2 - 14ab - 8b^2$
2. $3.5 + 7x - 9x^2 - 2.5 - 4x - 8 - 6x^2 - 17x$
3. $x^2 - 4y^2 + 3xy + 4y^2 - 16xy + 3 + 7y^2 - 18 + xy$
4. $2m^2 + 9m^2n^2 + 4n^2 - 3m^2n^2 - 19m^2 - 14n^2m^2 - 8n^2$
5. $2a^2b + 3a^2 - 4ab^2 - 6a^2b - 5b^2 - 11a^2b + 8a^2 - 9b^2$
6. $-2m^2n + 4m^2 - 5m^2n^2 - 3m^2n - 4n^2 + 2mn^2 - 4m^2 - 6m^2n^2$
7. $ax + 3by + 5mn - 4b^2y^2 - 3ax - 3by + 2ax - 4by^2 - 12mn$
8. $7x^2y + 3xy^2 - 2yx^2 - 6y^2x - 3x^2y - 7xy^2 + 4yx^2$
9. $-11abc + 3ac + 4acb - 4bc - 7ac + 6bc + 5ab + 4ac$
10. $15x^3 - 7x^2y - 4xy + 3x^2 - xy^2 - 8x^2y + 4x^2 - 9x^3 - 16xy - 3xy^2$

Exercise 5. Multiplication

Example 1: Multiply: $(-8x)(-2)(-5x)$.

Use the Associative Law when multiplying monomials. Start with an easy pair, if possible.

$(-8x)(-2y)(-5x)$

$(-8x)(10xy)$

$-80x^2y$

Perform the indicated multiplications.

1. $(-16a)(-32b)(-5c)$
2. $(4a)^2(-3a)^3$
3. $-(-3)^2(-a)^3(-b)^4(-abc)^2$
4. $(-2)^3(-a^2)(-b)^2(-a)^3$

Example 2: Multiply: $(3 - a + x)(-2a^2x)$.

Rewrite and use the Distributive Law to distribute the monomial over the polynomial.

$(-2a^2x)(3 - a + x)$

$-6a^2x + 2a^3x - 2a^2x^2$

Perform the indicated multiplications.

5. $-2a(-3a^2 + 4ab)$
6. $(.32m - .19n)(-.9mn)$
7. $(6a^2 - 14a - 91)(-8a^2)$
8. $(2a^2 - 3ab + 9b^2)(-\frac{1}{3}ab)$