Math Sheet

Name _____ Score _____ Teacher _____ Date _____

Basic Polynomial Operations

Student Worksheet

1. Name each polynomial

1. Name by degree and terms.

$5qx^7y^7 + 9qx^7y$

2. Name by degree and terms.

$4x^8 - 7x^7 - 7x^6 - 5x^4 - 4x$

3. Name by degree and terms.

$3x^{12} - 3x^9 - 5x^6 + 6x^4$

4. Name by degree and terms.

$9b^5r^3 + 7b^3r^3 - 8r^6$

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Basic Polynomial Operations

Student Worksheet

2. Simplify grouped polynomials

5. Simplify.

$$(7x^4+2x)+(2x^7-5x^4-4x^3)+(-8x^3-4x^2-6)$$

6. Simplify.

$$(-x^7-x^5+3x^3)-(x^7-3x^5)$$

7. Simplify.

$$(x^7+7x^2-5x)-(-x^7-6x^4-6x)+(-8x^5+3x^4-2)$$

8. Simplify.

$$(-3x^7+x^2)-(-9x^7+8x^4)$$

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Basic Polynomial Operations

Student Worksheet

3. Multiply quadratic polynomials

9. Expand and simplify.

$(8x^2+2x)(9x^2+9)$

10. Expand and simplify.

$(x^2+4x+3)(x^2+8x+6)$

11. Expand and simplify.

$(x^2+9x)(x^2+7)$

12. Expand and simplify.

$(x^2+9x)(x^2+2x+3)$

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Basic Polynomial Operations

Answer Key

1. Name each polynomial

1. Name by degree and terms.

$$5qx^7y^7 + 9qx^7y$$

Term degrees: 15, 9. Degree 15; binomial.

2. Name by degree and terms.

$$4x^8 - 7x^7 - 7x^6 - 5x^4 - 4x$$

Term degrees: 8, 7, 6, 4, 1. Degree 8; polynomial - 5 terms.

3. Name by degree and terms.

$$3x^{12} - 3x^9 - 5x^6 + 6x^4$$

Term degrees: 12, 9, 6, 4. Degree 12; polynomial - 4 terms.

4. Name by degree and terms.

$$9b^5r^3 + 7b^3r^3 - 8r^6$$

Term degrees: 8, 6, 6. Degree 8; trinomial.

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Basic Polynomial Operations

Answer Key

2. Simplify grouped polynomials

5. Distribute signs, then collect.

$(7x^4 + 2x) + (2x^7 - 5x^4 - 4x^3) + (-8x^3 - 4x^2 - 6)$

Signs: $(7x^4 + 2x) + (2x^7 - 5x^4 - 4x^3) + (-8x^3 - 4x^2 - 6)$

Answer: $2x^7 + 2x^4 - 12x^3 - 4x^2 + 2x - 6$

6. Distribute signs, then collect.

$(-x^7 - x^5 + 3x^3) - (x^7 - 3x^5)$

Signs: $(-x^7 - x^5 + 3x^3) + (-x^7 + 3x^5)$

Answer: $-2x^7 + 2x^5 + 3x^3$

7. Distribute signs, then collect.

$(x^7 + 7x^2 - 5x) - (-x^7 - 6x^4 - 6x) + (-8x^5 + 3x^4 - 2)$

Signs: $(x^7 + 7x^2 - 5x) + (x^7 + 6x^4 + 6x) + (-8x^5 + 3x^4 - 2)$

Answer: $2x^7 - 8x^5 + 9x^4 + 7x^2 + x - 2$

8. Distribute signs, then collect.

$(-3x^7 + x^2) - (-9x^7 + 8x^4)$

Signs: $(-3x^7 + x^2) + (9x^7 - 8x^4)$

Answer: $6x^7 - 8x^4 + x^2$

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Basic Polynomial Operations

Answer Key

3. Multiply quadratic polynomials

9. Multiply every term pair.

$$(8x^2 + 2x)(9x^2 + 9)$$

Products: $72x^4 + 72x^2 + 18x^3 + 18x$

Answer: $72x^4 + 18x^3 + 72x^2 + 18x$

10. Multiply every term pair.

$$(x^2 + 4x + 3)(x^2 + 8x + 6)$$

Products: $x^4 + 8x^3 + 6x^2 + 4x^3 + 32x^2 + 24x + 3x^2 + 24x + 18$

Answer: $x^4 + 12x^3 + 41x^2 + 48x + 18$

11. Multiply every term pair.

$$(x^2 + 9x)(x^2 + 7)$$

Products: $x^4 + 7x^2 + 9x^3 + 63x$

Answer: $x^4 + 9x^3 + 7x^2 + 63x$

12. Multiply every term pair.

$$(x^2 + 9x)(x^2 + 2x + 3)$$

Products: $x^4 + 2x^3 + 3x^2 + 9x^3 + 18x^2 + 27x$

Answer: $x^4 + 11x^3 + 21x^2 + 27x$