Algebra: Polynomial Operations

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Name: _____ Date: _____ Score: _____

DIRECTIONS *Perform the indicated polynomial operation. Combine like terms and write in standard form.*

1 Add:

$(3x^2+2x-1)+(x^2-4x+5)$

Answer: _____

2 Subtract:

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

Answer: _____

3 Multiply:

$3x(2x^2 - 4x + 1)$

Answer: _____

4 Multiply (FOIL):

$(x+3)(x+5)$

Answer: _____

5 Multiply:

$(x-4)(x+4)$

Answer: _____

6 Square:

$(x+3)^2$

Answer: _____

7 Multiply:

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

Answer: _____

8 Add:

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

Answer: _____

9 Subtract:

$(5x^2-3x+2)-(5x^2+2x-1)$

Answer: _____

10 Multiply:

$(x+2)(x^2-2x+4)$

Answer: _____

Answer Key & Solutions

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TEACHER NOTES *Adding/subtracting: combine like terms. Multiplying: use distributive property or FOIL. Standard form: descending degree*

1 $(3x^2+2x-1)+(x^2-4x+5)$

$= 4x^2 - 2x + 4$

Combine: $(3+1)x^2+(2-4)x+(-1+5)$

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

$= 2x^2 + 4x - 6$

Distribute neg: $4x^2+3x-2x^2+x-6$

3 $3x(2x^2-4x+1)$

$= 6x^3 - 12x^2 + 3x$

Distribute 3x to each term

4 $(x+3)(x+5)$

$= x^2 + 8x + 15$

F:x^2, O:5x, I:3x, L:15 → $x^2+8x+15$

5 $(x-4)(x+4)$

$= x^2 - 16$

Difference of squares: x^2-16

6 $(x+3)^2$

$= x^2 + 6x + 9$

$a^2+2ab+b^2$: x^2+6x+9

7 $(2x-1)(3x+4)$

$= 6x^2 + 5x - 4$

F:$6x^2$, O:8x, I:-3x, L:-4

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

$= x^3 + 3x^2 - x + 3$

No x^3 match; $3x^2$; (-2+1)x; (7-4)

9 $(5x^2-3x+2)-(5x^2+2x-1)$

$= -5x + 3$

x^2 cancel; (-3-2)x; (2+1)=3

10 $(x+2)(x^2-2x+4)$

$= x^3 + 8$

Sum of cubes: $(x+2)(x^2-2x+4)=x^3+8$