

Algebra 2  
Unit 2 Review  
Operations with Polynomials

Name: \_\_\_\_\_

Date: \_\_\_\_\_ Period: \_\_\_\_\_

1.  $-x^2 + 9x^3 + 5x$   
Standard form:  $9x^3 - x^2 + 5x$

Leading Coefficient: 9

Degree: 3

Name by degree: Cubic

Name by # terms: Trinomial

2.  $3x^4 + 2x^5 - x + 10$

Standard form:  $2x^5 + 3x^4 - x + 10$

Leading Coefficient: 2

Degree: 5

Name by degree: Quintic

Name by # terms: Poly w/ 4 terms

3.  $(5x^4 + 3x^2 - 2x) + (11x^2 + 7)$   
 $5x^4 + 14x^2 - 2x + 7$

4.  $(5x^4 + 3x^2 - 2x) - (11x^2 + 7)$   
 $(5x^4 + 3x^2 - 2x) + (-11x^2 - 7)$   
 $5x^4 - 8x^2 - 2x - 7$

5.  $(5x^4 + 3x^2 - 2x)(11x^2 + 7)$

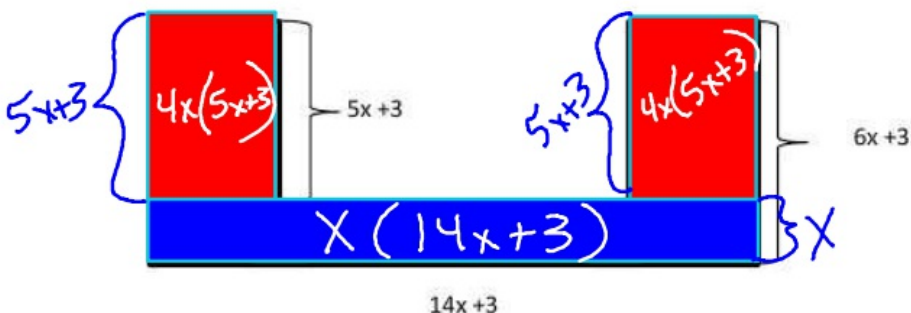
6.  $(x^3 - 6)(3x^4 + 7x^2 - 4x)$

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

$x^4y^3 = x \cdot x \cdot x \cdot x \cdot y \cdot y \cdot y$

$3x^4 = 3 \cdot x \cdot x \cdot x \cdot x$

	$3x^4$	$7x^2$	$-4x$
$x^4y^3$	$3x^8y^3$		



8. Find the perimeter of the above figure.

$$50x + 18$$

9. Find the area of the above figure.

$$20x^2 + 12x + 20x^2 + 12x + 14x + 3x$$

$$54x^2 + 27x$$

$$(2x)^2 = 2^2 x^2$$

10. Using Pascal's triangle, expand  $(2x+y)^4$

$$1 \binom{4}{0} (2x)^4 (y)^0 + 4 \binom{4}{1} (2x)^3 (y)^1 + 6 \binom{4}{2} (2x)^2 (y)^2 + 4 \binom{4}{3} (2x)^1 (y)^3 + 1 \binom{4}{4} (2x)^0 (y)^4$$

$$16x^4 + 32x^3y + 24x^2y^2 + 8xy^3 + y^4$$

11. Using Pascal's triangle, expand  $(x-2y)^3$

$$1 \cdot (4)^4 \cdot (-2)^0$$

$$4 \cdot 4^3 x^3 \cdot -2^1 y^1$$

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Operations with Polynomials

12. Expand:  $(4x - 2y)^4$

$$1 \binom{4}{0} (4x)^4 (-2y)^0 + 4 \binom{4}{1} (4x)^3 (-2y)^1 + 6 \binom{4}{2} (4x)^2 (-2y)^2 + 4 \binom{4}{3} (4x)^1 (-2y)^3 + 1 \binom{4}{4} (4x)^0 (-2y)^4$$

$$256x^4 - 512x^3y + 384x^2y^2 - 128xy^3 + 16y^4$$

• Composition of Functions

$$f(x) = 4x + 6 \quad g(x) = 7x$$

13. Find  $f(4x) = 4(4x) + 6 = 16x + 6$

14. Find  $g(x + 3) = 7(x + 3) = 7x + 21$

15. Find  $f(g(x)) = 4(7x) + 6 = 28x + 6$

16. Find  $g(f(x)) = 7(4x + 6) = 28x + 42$

• Composition of Functions

$$f(x) = 2x^2 - 6x - 7 \quad g(x) = x + 5$$

17. Find  $f(3)$

18. Find  $g(x + 9)$

19. Find  $g(f(x))$

20. Find  $f(g(x))$

$f(x) = 2x + 7$      $g(x) = 4x^3$

19. A. Find the Inverse of  $f(x)$

$$y = 2x + 7$$

$$x = 2y + 7$$

$$\frac{-7}{-7} \quad \frac{-7}{-7}$$

$$\frac{x-7}{2} = \frac{2y}{2}$$

$$y = \frac{x-7}{2}$$

$$f^{-1}(x) = \frac{x-7}{2}$$

B. Verify the inverse

20. A. Find the Inverse of  $g(x)$

$$y = 4x^3$$

$$\frac{x}{4} = y^3$$

$$\frac{x}{4} = \frac{4y^3}{4}$$

$$\sqrt[3]{\frac{x}{4}} = \sqrt[3]{4y^3}$$

$$\sqrt[3]{\frac{x}{4}} = y$$

B. Verify the inverse

**Discovering Patterns**

Name \_\_\_\_\_



$$4x = 4 \cdot x$$

$$(4x)(2y) = \begin{array}{c} 4 \cdot x \cdot 2 \cdot y \\ 4 \cdot 2 \cdot x \cdot y \\ 8xy \end{array}$$

$$(2x)^2 (3y)^2$$

$$2^2 x^2 3^2 y^2$$

$$2^2 \cdot 3^2 \cdot x^2 y^2$$

$$\boxed{36x^2y^2}$$