Name **Answer Key**

Ms. Schmidt

Date _____

Intermediate Algebra

Final Review #1

Operations with Polynomials

Given: $f(x) = 3x - 1$, $g(x) = x - 9$, $k(x) = x^2 - 4x + 4$, $m(x) = 3x^2 + 8x + 5$ find each of the following.

1st!

1) $f(x) + k(x)$

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

$x^2 - x + 3$

2) Subtract $f(x)$ from $m(x)$

$(3x^2 + 8x + 5) - (3x - 1)$

$3x^2 + 8x + 5 - 3x + 1$

$3x^2 + 5x + 6$

3) $f(x) \cdot g(x)$

$(3x - 1)(x - 9)$

$3x^2 - 27x - x + 9$

$3x^2 - 28x + 9$

4) $m(x) - k(x)$

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

$3x^2 + 8x + 5 - x^2 + 4x - 4$

$2x^2 + 12x + 1$

5) Subtract $g(x)$ from $k(x)$

$(x^2 - 4x + 4) - (x - 9)$

$x^2 - 4x + 4 - x + 9$

$x^2 - 5x + 13$

6) $m(x) + g(x)$

$(3x^2 + 8x + 5) + (x - 9)$

$3x^2 + 9x - 4$

7) $g(x) \cdot k(x)$

$(x - 9)(x^2 - 4x + 4)$

	x^2	$-4x$	$+4$
x	x^3	$-4x^2$	$4x$
-9	$-9x^2$	$36x$	-36

$x^3 - 4x^2 - 9x^2 + 36x + 4x - 36$

$x^3 - 13x^2 + 40x - 36$

8) Subtract $k(x)$ from $m(x)$

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

$3x^2 + 8x + 5 - x^2 + 4x - 4$

$2x^2 + 12x + 1$

Given If $f(x) = x - 4$, $g(x) = 4x + 8$, $k(x) = 2x - 1$, $m(x) = 3x + 6$ find each of the following:

9) $g(f(2))$ — insicle first

$f(2) = 2 - 4 = -2$

$g(-2) = 4(-2) + 8 = \boxed{0}$

10) $g(f(x))$ — put insicle into outside (for x)

$f(x)$ ↓

$4(x - 4) + 8$

$4x - 16 + 8$

$\boxed{4x - 8}$

11) $k(m(-4))$

$m(-4) = 3(-4) + 6 = -6$

$k(-6) = 2(6) \cdot 4 = -13$

12) $k(m(x))$

$2(3x + 6) - 1$

$6x + 12 - 1$

$6x - 11$

13) $k(f(3))$

$f(3) = 3 - 4 = -1$

$k(-1) = 2(-1) - 1 = -3$

14) $k(f(x))$

$2(x - 4) - 1$

$2x - 8 - 1$

$2x - 9$

15) $m(g(0))$

$g(0) = 4(0) + 8 = 8$

$m(8) = 3(8) + 6 = 30$

16) $m(g(x))$

$3(4x + 8) + 6$

$12x + 24 + 6$

$12x + 30$

16) Simplify $(x-5)^2$ ← **7000 of them!**

$(x-5)(x-5)$

$x^2 - 5x - 5x + 25$

$x^2 - 10x + 25$

17) Simplify $(x+6)^2$

$(x+6)(x+6)$

$x^2 + 6x + 6x + 36$

$x^2 + 12x + 36$

18) Simplify $(2x+1)^2$

$(2x+1)(2x+1)$

$4x^2 + 2x + 2x + 1$

$4x^2 + 4x + 1$

19) Simplify $(x-3)^2$

$(x-3)(x-3)$

$x^2 - 3x - 3x + 9$

$x^2 - 6x + 9$

Inverse Functions

19) Find $f^{-1}(x)$ if $f(x) = 2x + 3$

↑ Switch x and y!

$y = 2x + 3$

$x = 2y + 3$

$-3 \qquad -3$

$\dfrac{x - 3}{2} = \dfrac{2y}{2}$

$\boxed{\dfrac{x-3}{2} = y = f^{-1}(x)}$

20) Find $f^{-1}(x)$ if $f(x) = 5x - 11$

$x = 5y - 11$

$+11$

$\dfrac{x + 11}{5} = \dfrac{5y}{5}$

$\dfrac{x+11}{5} = y = f^{-1}(x)$

21) Find $f^{-1}(x)$ if $f(x) = 6x + 7$

$x = 6y + 7$

$-7 \qquad -7$

$\dfrac{x - 7}{6} = \dfrac{6y}{6}$

$\dfrac{x-7}{6} = y = f^{-1}()$

22) Find $f^{-1}(x)$ if $f(x) = 8x - 1$

$x = 8y - 1$

$+1 \qquad +1$

$\dfrac{x + 1}{8} = \dfrac{8y}{8}$

$\dfrac{x+1}{8} = y = f^{-1}(x)$

23) Find $f^{-1}(x)$ if $f(x) = -2x - 7$

$x = -2y - 7$

$+7 \qquad +7$

$\dfrac{x + 7}{-2} = \dfrac{-2y}{-2}$

$\dfrac{x+7}{-2} = y = f^{-1}(x)$

24) Find $f^{-1}(x)$ if $f(x) = -x + 5$

$x = -y + 5$

$-5 \qquad -5$

$\dfrac{x - 5}{-1} = \dfrac{-y}{-1}$

$-x + 5 = y = f^{-1}(x)$