NAME Key DATE _____ PERIOD _____

Chapter 6 Mid-Chapter Test

SCORE _____

(Lessons 6-1 through 6-4)

Part I: Write the letter for the correct answer in the blank at the right of each question.

1. Given $f(x) = x^2 + 3x - 5$ and $g(x) = 2x + 1$, find $(f - g)(x)$.

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

1. x^2+x-6

2. Given $f(x) = x^2 + 3x - 18$ and $g(x) = x - 3$, and $x \neq 1$, find $\left(\frac{f}{g}\right)(x)$.

$\frac{x^2+3x-18}{x-3} = \frac{(x+6)(x-3)}{x-3} = x+6$

2. $x+6$

3. If $f(x) = \{(2, 3), (4, 8), (7, -1)\}$ and $g(x) = \{(8, 2), (-1, 4), (2, 7)\}$, find $(g \circ f)(x)$, if it exists.

$g(f(x))$

$g(f(2)) = g(3) = ?$

$g(f(4)) = g(8) = 2$

$g(f(7)) = g(-1) = 4$

$g(f(2))$ does not exist

$g(f(4)) = 2$

3. $g(f(7)) = 4$

4. Identify the x-intercept of the graph of $y = \sqrt{3x - 1}$.

$0 = \sqrt{3x-1}$ $\quad x = 1/3$

4. $x = 1/3$

5. Identify the domain of the graph of $y > \sqrt{5x + 4}$.

$5x+4 \geq 0$ $\quad 5x \geq -4$ $\quad x \geq -4/5$

5. $x \geq -4/5$

Simplify

6. $\sqrt[3]{343x^6}$

343 → 7 · 49 → 7 · 7

6. $7x^2$

7. $\sqrt{49y^6z^2}$

$7y^3z$

7. $7y^3z$

Part II

8. Find $(f - g)(x)$ and $(f \cdot g)(x)$ for $f(x) = 2x - 8$ and $g(x) = 5x^2$.

$(f-g)(x) = 2x-8-5x^2$

$(f \cdot g)(x) = 5x^2(2x-8)$

$(f-g)(x) = -5x^2+2x-8$

8. $(f \cdot g)(x) = 10x^3 - 40x^2$

9. Find the inverse of the function $p(x) = 5x + 12$.

(9) $p = 5x+12$

$x = 5p+12$

$x-12 = 5p$

$\frac{x-12}{5} = p$

9. $p^{-1}(x) = \frac{x-12}{5}$

10. Use a calculator to approximate $\sqrt[4]{153}$ to three decimal places.

$(153)^{1/4}$

10. ≈ 3.517

11. Find the inverse of the function $f(x) = 2x - 3$. Then graph the function and its inverse.

$f(x) = 2x-3$

x	y
0	-3
1	-1
2	1

$y = 2x-3$

$x = 2y-3$

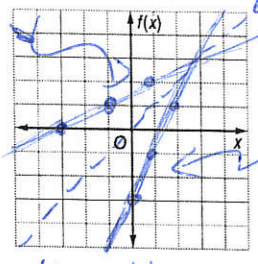
$x+3 = 2y$

$\frac{x+3}{2} = y$

$f^{-1}(x) = \frac{x+3}{2}$

x	y
-3	0
-1	1
1	2

11. $f^{-1}(x) = \frac{x+3}{2}$



12. Determine whether $g(x) = 2x + 4$ and $f(x) = \frac{1}{2}x - 2$ are inverse functions.

$f(g(x)) = \frac{1}{2}(2x+4) - 2$

$= x + 2 - 2$

$= x$ ✓

$g(f(x)) = 2\left(\frac{1}{2}x - 2\right) + 4$

$= x - 4 + 4$

$= x$ ✓

YES!

12. Yes, they are inverses