Math 1111   Sample Test 2   Name _____

2.1 – 2.7   Date _____

Directions: To receive partial credit you must show your work on a problem.

                    <u>Circle final answers</u>. All problems are 5 points each.

1. Find the slope of the line passing through
    (4.8, 3.1) and (–5.2, 1.6).

2. <u>Write the equation</u> of the line in slope-
    intercept form $(y = mx + b)$ that goes
    through (1, 1) and $\left(6, -\frac{2}{3}\right)$.

3. Find the slope-intercept form of the
    equation of the line passing through
    (–10,4) and has slope m = 0.

4. <u>Write the equation</u> of the line in slope-
    intercept form $(y = mx + b)$ that goes
    through (2, 1) and is perpendicular to
    $4x – 2y = 3$.

5. Is the following relation a function ?

    $\{(1,2),(5,7),(3,8),(5,4)\}$

6. Evaluate the function at each specified
    value and simplify. $f(x) = \sqrt{x + 8} + 2$

    a)   f(–8)   b)   f(1)

7.   Evaluate the function at each specified
       value and simplify. $f(x) = \dfrac{3x - 4}{5}$

    a)   f(2)   b)   f(–3)

8. State the Domain for the following:
    (Hint: draw graph first.)
    $g(x) = \sqrt{x - 10}$

9.   Determine the intervals of the domain over which the given functions is increasing, decreasing, and constant.
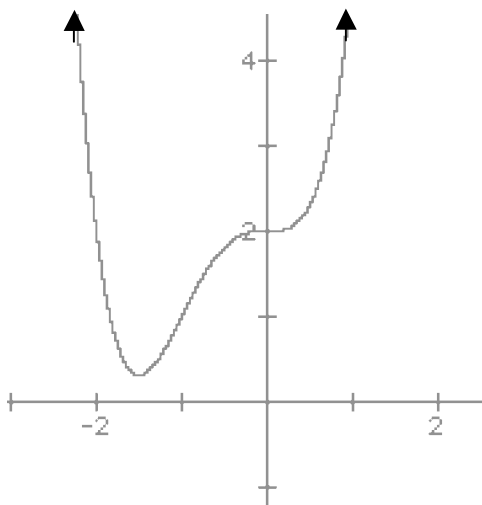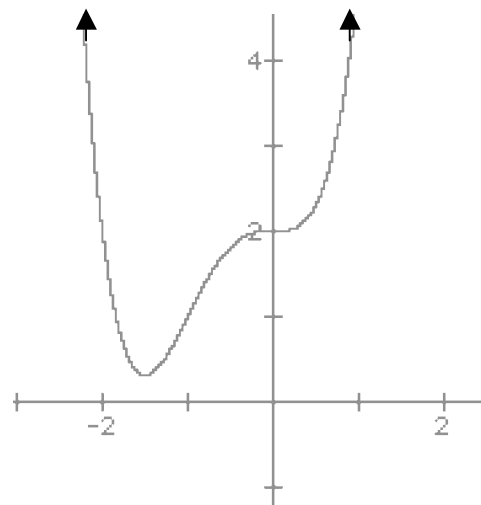
(-1,2)

(2,-3)
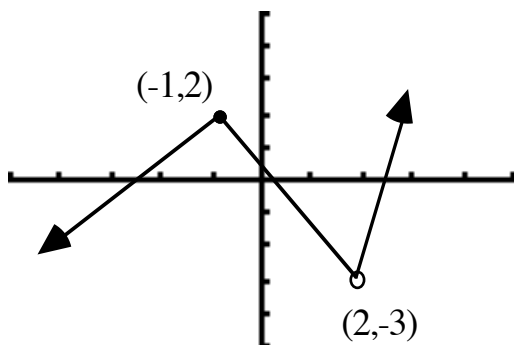
Increasing   _____

Decreasing   _____

Constant   _____

10.   Is the following graph a function ?
Yes or No

11.   State the Domain and Range for the following graph:

Domain = _____   Range = _____

12.   <u>Write an equation</u> for the function that is described as follows:

The shape of $f(x) = |x|$ but moved 10 units up and reflected over the x-axis.

13.   <u>Write an equation</u> for the function that is described as follows:

The shape of $f(x) = x^3$ but moved 6 units to the left, and 6 units down.

Answer: _____

Answer: _____

14.   Describe the transformation that occurs in the function. Remember to find the basic function first. Also sketch the graph.

$$f(x) = (x-1)^3 + 2$$

Description:

_____

_____

_____

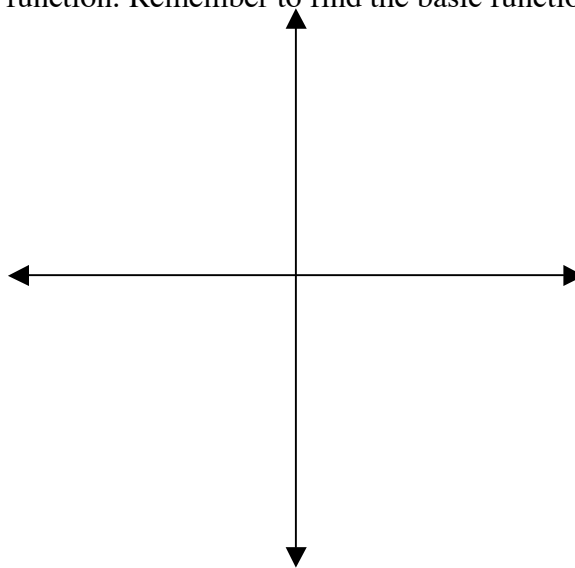For $f(x) = x^2$ and $g(x) = 2 - x$ Find the following:

15. $(f + g)(x)$ 16. $(f - g)(x)$

17. $(f \cdot g)(x)$ 18. $(f / g)(x)$

For $f(x) = x^2 + 1$ and $g(x) = x - 4$ Find the following:

19. $(f \cdot g)(6)$ 20. $(f + g)(2)$

For $f(x) = \dfrac{1}{3}x - 3$ and $g(x) = 3x + 1$ Find the following:

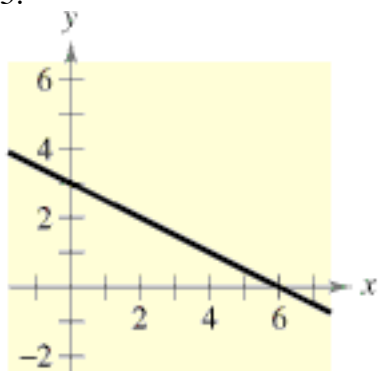21. $(f \circ g)(x)$ 22. $(g \circ f)(12)$

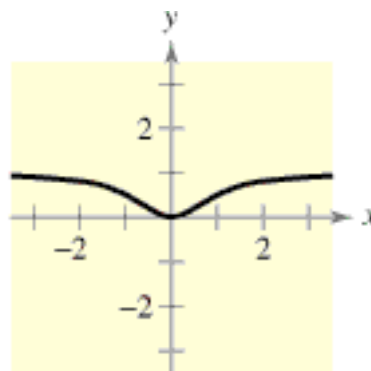23. $(f \circ f)(x)$ 24. $(g \circ g)(2)$

Does the following functions have an inverse ?   Yes or No. Why?

25.	26.
Yes or No	Yes or No

Show that $f(x) = 5x + 1$ and $g(x) = \dfrac{x-1}{5}$ are inverse functions <u>algebraically</u>.
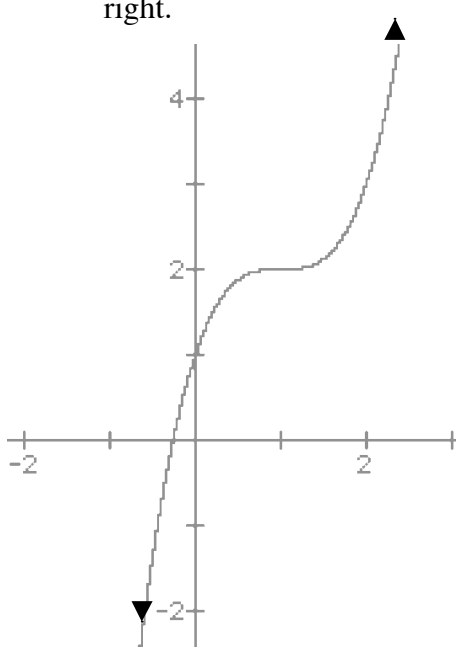
<u>You must show work</u>!

27. Find $(f \circ g)(x)$ 28. Find $(g \circ f)(x)$

Find the inverse for the following functions. (Note: you don't have to verify)

29. $f(x) = 2x - 3$ 30. $f(x) = \dfrac{x+1}{x-2}$

Answers to Sample Test 2

1.	$m = 0.15$	2.	$y = \dfrac{-1}{3}x + \dfrac{4}{3}$
3.	$y = 4$	4.	$y = \dfrac{-1}{2}x + 2$

5.	NO the 5's repeat !	6.	a) 2 b) 5
7.	a) 2/5 b) –13/5	8.	$[10,\infty)$
9.	Inc.= $(-\infty,-1]$ and $(2,\infty)$ Decr. = $[-1,2)$ Const = None	10.	Yes
11.	Domain = $(-\infty,\infty)$ Range = $[0.5,\infty)$	12.	$f(x) = -\lvert x \rvert - 10$
13. $f(x) = (x + 6)^3 - 6$ 15. $f(x) = x^2 - x + 2$ 16. $f(x) = x^2 + x - 2$ 17. $f(x) = x^2(2 - x) = 2x^2 - x^3$ 18. $f(x) = \dfrac{x^2}{2 - x}$ 19. 74 20. 3 21. $(f \circ g)(x) = x - \dfrac{8}{3}$ 22. 4 23. $(f \circ f)(x) = \dfrac{1}{9}x - 4$ 24. 22		14.	Vertical shift of $f(x) = x^3$ 2 units upward and horizontal shift of 1 unit to the right.
25.	Yes, by Horizontal Line Test !	26.	No, by Horizontal Line Test !
27.	$(f \circ g)(x) = x$? Yes !	28.	$(g \circ f)(x) = x$? Yes !
29.	$f^{-1}(x) = \dfrac{x + 3}{2}$	30.	$f^{-1}(x) = \dfrac{2x + 1}{x - 1}$