Math 1111 Sample Test 4 Name _____
Sections 2.5, 2.6, 3.1, 3.2 Date _____

Version A

Directions: To receive partial credit you must show your work on a problem. Circle final answers. All problems are 5 points each.

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

1. $(f + g)(x)$

2. $(f - g)(x)$

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

4. $(f / g)(x)$

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

5. $(f \cdot g)(6)$

6. $(f + g)(2)$

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

7. $(f \circ g)(x)$

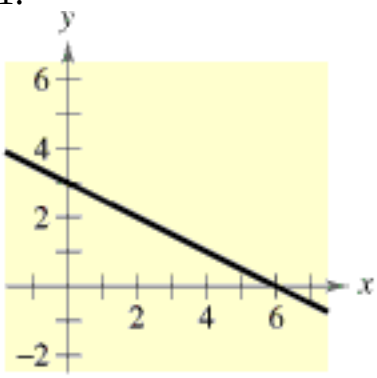
8. $(g \circ f)(12)$

9. $(f \circ f)(x)$

10. $(g \circ g)(2)$

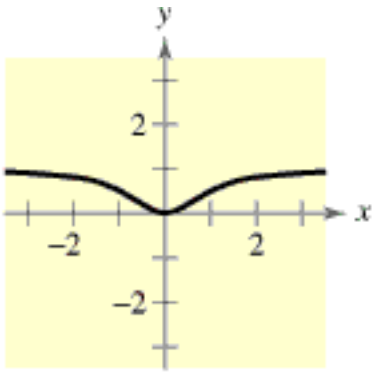
Does the following functions have an inverse ? Yes or No. Why?

11.



Yes or No

12.



Yes or No

Show that $f(x) = 5x + 1$ and $g(x) = \frac{x-1}{5}$ are inverse functions <u>algebraically</u>.

<u>You must show work</u>!

13. Find $(f \circ g)(x)$

14. Find $(g \circ f)(x)$

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

15. $f(x) = 2x - 3$

16. $f(x) = \frac{x+1}{x-2}$

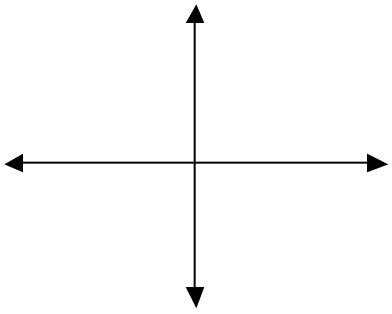
For the quadratic function $y = -2x^2 - 12x - 16$ find the following.

17. Vertex = _____

18. x and y intercepts
x-int = _____ y-int = _____

For the quadratic function $y = -2x^2 - 12x - 16$ find the following.

19. Graph



20. Domain and Range

D = _____ R = _____

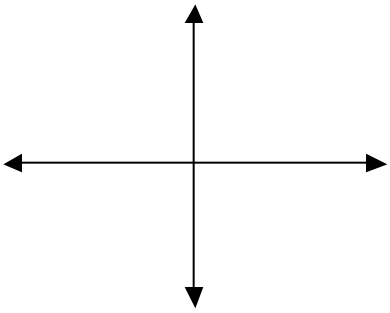
Describe the transformation that occurs in the function. Remember to find the basic function first. Also sketch the graph.

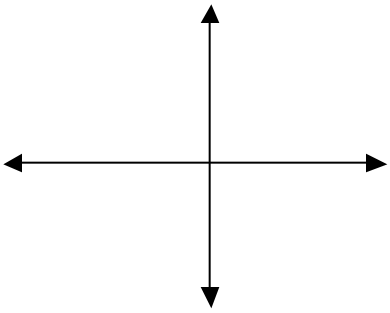
21. $f(x) = -x^4 + 4$

Description:_____
_____
_____
_____
_____

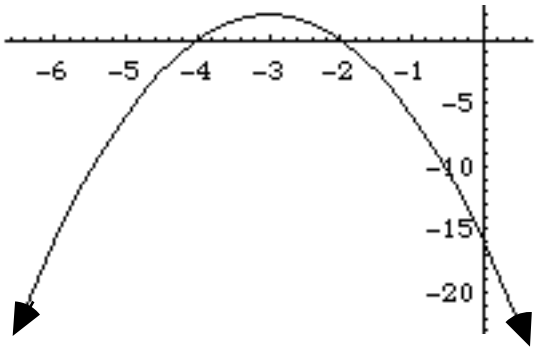
22. $f(x) = (x-2)^3 - 2$

Description:_____
_____
_____
_____
_____

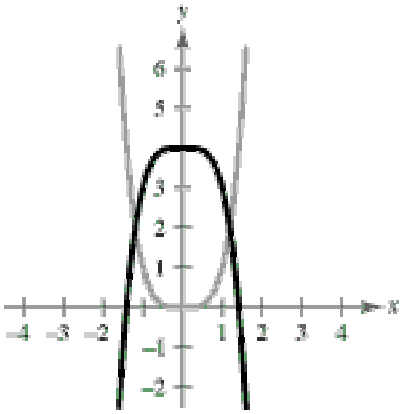
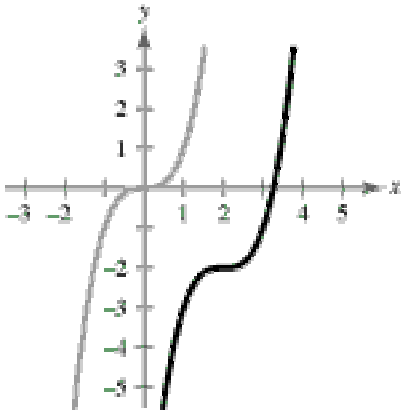




Answers to Sample Test 4

1. $f(x) = x^2 - x + 2$	2. $f(x) = x^2 + x - 2$
3. $f(x) = x^2(2 - x) = 2x^2 - x^3$	4. $f(x) = \dfrac{x^2}{2 - x}$
5. 74	6. 3
7. $(f \circ g)(x) = x - \dfrac{8}{3}$	8. 4
9. $(f \circ f)(x) = \dfrac{1}{9}x - 4$	10. 22
11. Yes, by Horizontal Line Test !	12. No, by Horizontal Line Test !
13. $(f \circ g)(x) = x$? Yes !	14. $(g \circ f)(x) = x$? Yes !
15. $f^{-1}(x) = \dfrac{x + 3}{2}$	16. $f^{-1}(x) = \dfrac{2x + 1}{x - 1}$
17. vertex: (–3, 2)	18. x - int.: (–4, 0), (–2, 0) y - int.: (0, –16)
19. 	20. Domain= $(-\infty, \infty)$ Range = $(-\infty, 2]$

Answers to #21 and #22 are on the next page.

21.  Reflection in the x-axis and then a vertical shift four units upward	22.  Horizontal shift two units to the right and a vertical shift two units downward