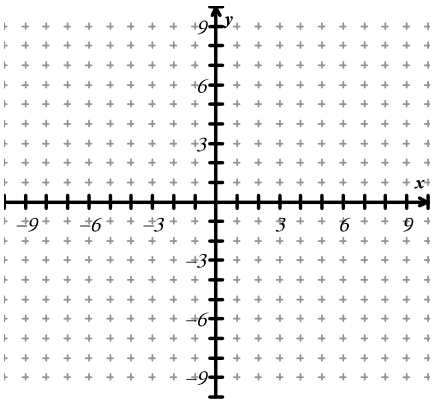


REVIEW FOR UNIT 2 TEST

NAME: _____

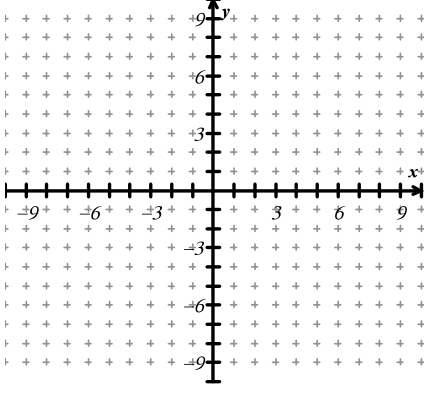
Graph the function using transformations. **State the name** of each function and whether each function is a stretch, shrink, or standard.

1. $f(x) = 7$



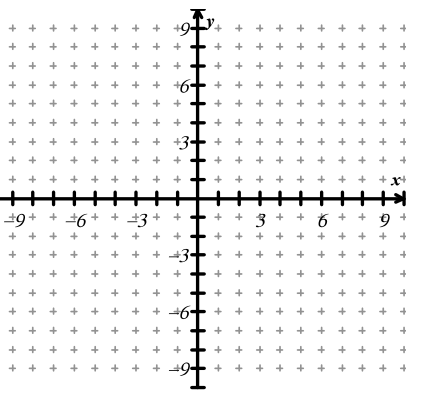
Function Name: _____

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



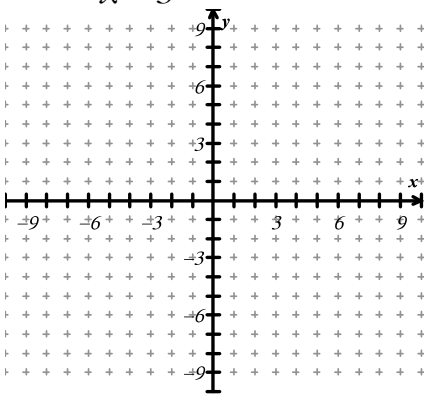
Function Name: _____

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



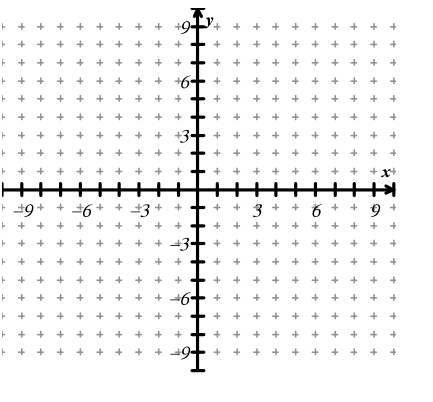
Function Name: _____

4. $f(x) = \frac{1}{x-3} + 1$



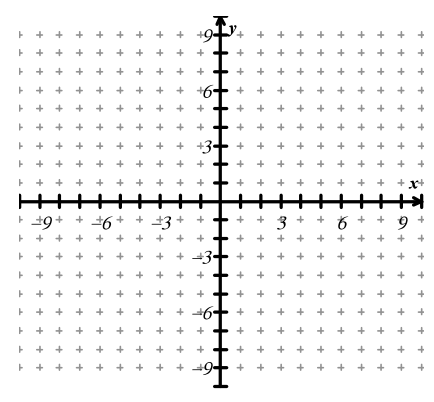
Function Name: _____

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



Function Name: _____

6. $f(x) = -\frac{3}{2}|x-1| + 5$



Function Name: _____

Find the following for $f(x) = 2x - 5$ and $g(x) = 5x - 8$

7. $(f + g)(2)$	8. $(f - g)(x)$
9. $(f \cdot g)(x)$	10. $(f \circ g)(x)$

Find the following for $f(x) = \sqrt{x}$ and $g(x) = 4x - 7$

11. Find $\left(\frac{f}{g}\right)(x)$.	12. Find the domain of $\left(\frac{f}{g}\right)(x)$. Write your answer in interval notation.
--	--

Find the following.

13. $f(x) = 2x + 6$ and $g(x) = 2x^2 + 1$ Find $(g \circ f)(3)$.	14. $f(x) = 5x + 8$ and $g(x) = 3x - 1$ Find $(g \circ f)(x)$.
--	--

15. Evaluate each expression using the table.

a) $(f \circ g)(-2) =$

b) $(f \circ f)(0) =$

c) $(g \circ f)(1) =$

x	-3	-2	-1	0	1	2	3
$f(x)$	-7	-5	-3	-1	3	5	5
$g(x)$	8	3	0	-1	0	3	8

16. Find $(f \circ g)(x)$ and state the domain. Write your answer in interval notation.

$$f(x) = \frac{1}{x} \quad \text{and} \quad g(x) = \frac{1}{2x-3}$$

17. Find $(f \circ g)(x)$ and state the domain. Write your answer in interval notation.

$$f(x) = \frac{3}{x+2} \quad \text{and} \quad g(x) = \frac{-5}{2x+5}$$

18. Find the functions f and g so that the composition of f and g is $H(x) = 2(5 - 2x^3)^2$

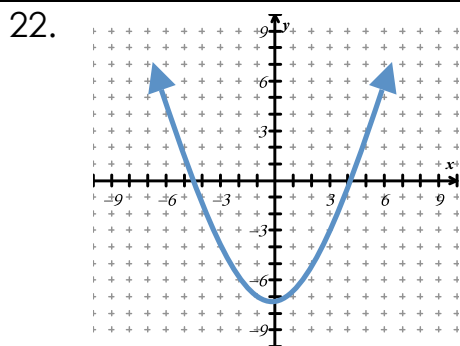
19. Find the functions f and g so that the composition of f and g is $H(x) = \sqrt[3]{4x+1}$

20. Find $f^{-1}(x)$ if $f(x) = 2x^3 - 3$.

21. Verify, using compositions, that f and g are inverse functions.

$$f(x) = \sqrt[3]{-8x-6}, \quad g(x) = -\frac{x^3+6}{8}$$

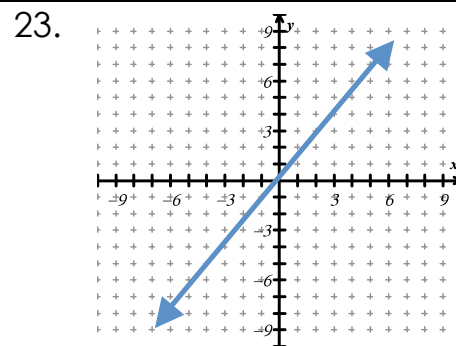
Determine if each function is one-to-one. Explain.



One-to-one: Yes or No

Domain: _____ Increase: _____

Range: _____ Decrease: _____



One-to-one: Yes or No

Domain: _____ Increase: _____

Range: _____ Decrease: _____

24. If $f(x) = 7x^3 + 3x^2 - x + C$ and $f(-2) = 1$, what is the value of C ?

Applications.

25. If the height of a cone is 5 times the radius, express the volume V as a function of r . **(memorize formula)**

26. Let $P = (x, y)$ be a point on the graph of $y = 2x^2 - 5$. **(memorize formula)**
Express the distance d from P to the origin as a function of x .

27. A ball is dropped from a height of 64 feet. The height of the ball t seconds after it is dropped is given by the function $h(t) = 128t - 16t^2$.

a) Find $h(1)$. What does $h(1)$ mean?

b) At what time will the ball hit the ground?

28. A rectangular piece of metal has a length that is two feet more than its width. An open box is to be constructed by removing a square of side 2 feet from each corner and turning up the edges. If the box is to hold 30 cubic feet, what should be the dimensions of the sheet metal? **(memorize formula)**

Determine whether the relation represents a function. Explain.

29. $\{(-2, 6), (2, 4), (4, 1), (8, -2)\}$

30. $y^2 + x = 3$

31. $y = 4x^2 - 9x + 7$

Find the domain of the functions. Use interval notation.

32. $y = \frac{3x-4}{x-1}$

33. $f(x) = \frac{x}{\sqrt{x-10}}$

34. $f(x) = \frac{-1}{2}x^5$

35. $y = \frac{-5x}{2x+1}$

36. Find **ALL** intercepts. Write as ordered pairs.
 $y = 12x^2 - 5x - 3$

37. Domain: _____

Range: _____

Increasing: _____

Decreasing: _____

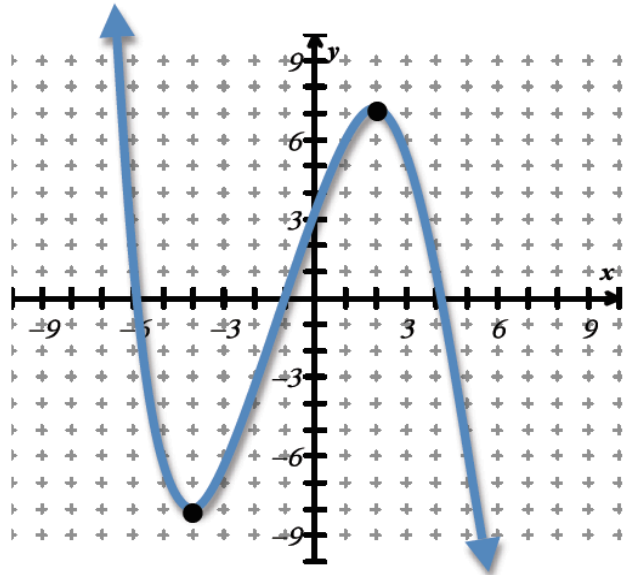
Local Maxima: _____

Local Minimum: _____

$f(x) < 0$: _____

$f(x) \geq 0$: _____

If $f(x) = -6$, what could x be?



ALL Intercepts: _____

In how many places will $y = 4$ intercept the graph?

Evaluate the functions.

38. $f(-2)$ when $f(x) = 2x^2 + 3x + 2$

39. $-f(x)$ when $f(x) = -2x^2 + 4x - 3$

40. $k(m - 3)$ when $k(p) = \frac{-p^2 - 5}{4p + 3}$

41. If $f(x) = 3x - 5$, find the following:

$$\frac{f(x+2) - f(2)}{2}$$

42. $\frac{f(x+h) - f(x)}{h}$, when $f(x) = 3x^2 - x + 1$

Determine if each function is even, odd, or neither.

43. $f(x) = -3x^2 - 2x + 3$	44. $f(x) = 5x^3 + 2x$
45. $f(x) = 3x^4 - x^2$	46. $f(x) = 5$

Given the function: **$f(x) = x^2 + 4x$** , answer the questions. **(memorize formula!)**

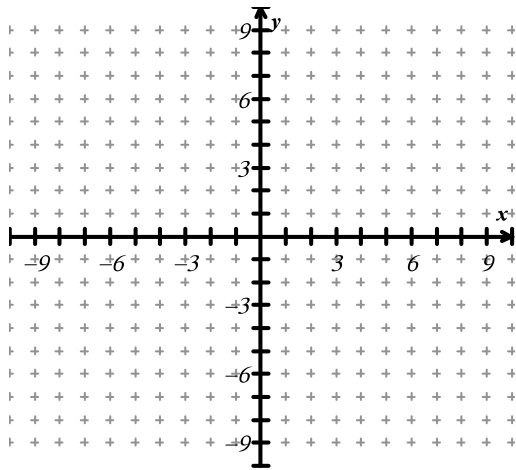
47. Find the average rate of change from 1 to x .	48. Find the slope of the secant line containing the points $(1, f(1))$ and $(5, f(5))$.
49. Find the average rate of change from 3 to 7.	50. Find the equation of the secant line containing points $(3, f(3))$ and $(7, f(7))$.

Evaluate the piecewise functions.

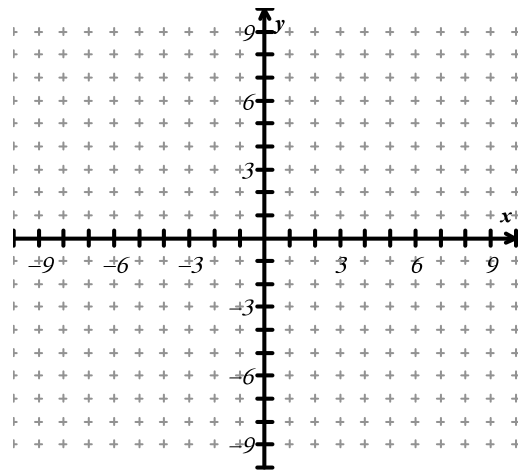
$$51. f(x) = \begin{cases} -x^2 - 3, & x \leq -1 \\ \sqrt[3]{-20x + 3} & x > -1 \end{cases}, \quad f(-2) = \underline{\hspace{2cm}} \quad f(1) = \underline{\hspace{2cm}} \quad f\left(-\frac{1}{4}\right) = \underline{\hspace{2cm}}$$

Graph the functions.

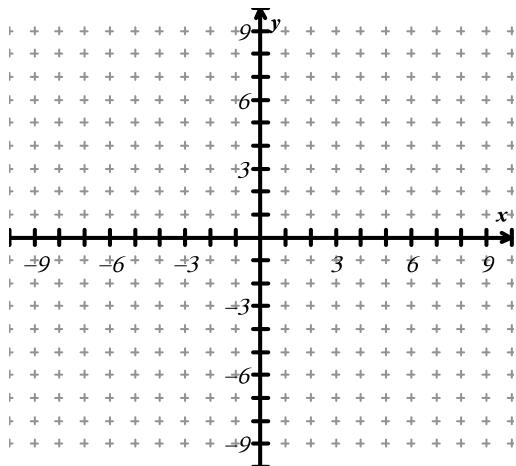
$$52. f(x) = \begin{cases} -x - 3, & x < 0 \\ \sqrt{x} + 2 & x \geq 0 \end{cases}$$



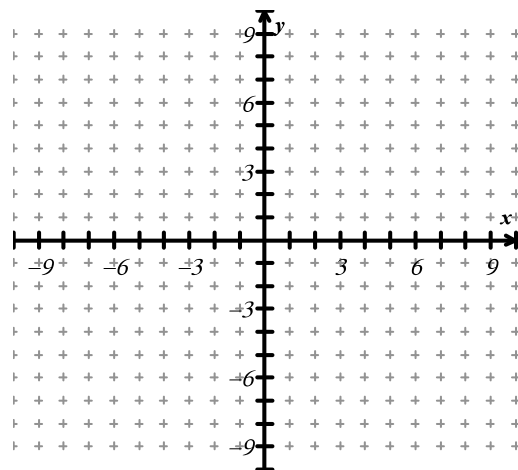
$$53. f(x) = \begin{cases} 4, & x < 0 \\ x^2 - 2 & x \geq 0 \end{cases}$$



$$54. f(x) = \begin{cases} -|x|, & x < -2 \\ 2x^2, & -2 \leq x \leq 2 \\ -|x| & x > 2 \end{cases}$$



$$55. f(x) = \begin{cases} \frac{1}{2}x + 3, & -6 < x < -2 \\ x^3, & -2 \leq x \leq 1 \\ 2\sqrt{x}, & x > 1 \end{cases}$$



Quick Questions: For each question, circle either A or B.

	QUESTION	ANSWER A	ANSWER B
1	Function or not: $5x^2 + 2 = y$	Yes	No
2	Find the domain: $f(x) = (x + 4)^3$	$(-\infty, \infty)$	$\mathcal{R}, x \neq -4$
3	Find the domain: $f(x) = \frac{x}{3x-1}$	$x > \frac{1}{3}$	$\left(-\infty, \frac{1}{3}\right) \cup \left(\frac{1}{3}, \infty\right)$
4	Find the domain: $f(x) = \sqrt{x-6}$	$x > 6$	$x \geq 6$
5	When writing intervals of increasing and decreasing, use:	x-values	y-values
6	How would you write a maximum:	(3, 4)	$x = 3$
7	Which set could represent the interval where $f(x) < 0$?	(0, 4)	[0, 4]
8	What is the rule for odd functions:	$f(-x) = f(x)$	$f(-x) = -f(x)$
9	How do you find x-intercepts (algebraically).	Substitute 0 for x	Substitute 0 for y
10	How do you find y-intercepts (algebraically).	Substitute 0 for x	Substitute 0 for y
11	How do you find out when a trajectory will hit the ground?	Sub 0 for $f(x)$	Sub 0 for x.
12	The graph: $y = (x + 3)^2 - 5$	Shifts right	Shifts left
13	The graph: $y = \frac{-1}{3}(x + 3)^2 - 5$	Is a stretch	Is a shrink
14	The graph: $y = \sqrt{-x}$	Is reflected in the x-axis	Is reflected in the y-axis
15	How do you find an inverse function?	Graph the function	Switch the x and y
16	How can you tell if a function is one-to-one (graphically).	Use the vertical line test	Use the horizontal line test
17	Which one is function composition?	$(f \bullet g)(x)$	$(f \circ g)(x)$
18	$f(x)=4x$ and $g(x)=2x^3$. Find $(f \bullet g)(x)$.	$8x^4$	$8x^3$
19	What do you have to do when finding the domain of a composition function?	Check with domain of the outside function	Check with domain of the inside function
20	What 2 functions make up: $H(x)=(x+1)^2$		

