Math 95 Exam 1 Review Name: _____

1. The functions f and g are given below in a table and a graph. Answer the questions below using these functions.

x	-4	-2	0	1	3	5
$f(x)$	8	5	3	0	-2	-6

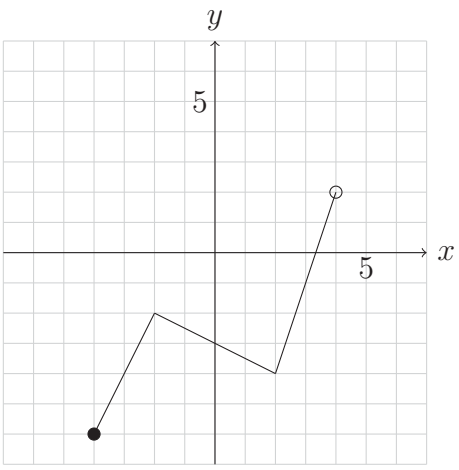


Figure 13: $g(x)$

a. Find the following

i. $f(3) =$ _____

ii. $f(-2) =$ _____

iii. $g(0) =$ _____

iv. $g(2) =$ _____

v. When $f(x) = 5$, then $x =$_____ .

vi. When $g(x) = -1$, then $x =$_____ .

vii. When $g(x) = -4$, then $x =$_____ .

b. What is the domain of g?

c. What is the range of g?

d. Find all x for which $g(x) > -1$

2. Given $g(x) = \frac{x}{x+2}$, find each of the following and write the corresponding ordered pair:

   a. $g(2)$

   b. $g(-3)$

   c. $g(0)$

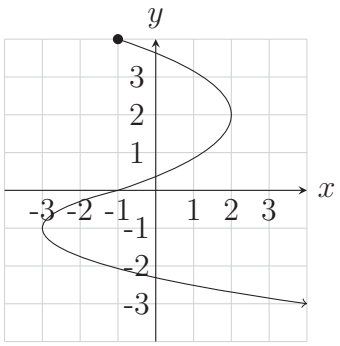
   d. $g(-1)$

3. Determine whether the following relationships between inputs and outputs can be categorized as a function and justify your response. State the domain and range of both relations.

   a. $\{(-2, 7), (3, 4), (5, 9), (2, 4), (3, -7)\}$

   b. $\{(2, .5), (-7, .5), (-1, .5), (3, 2), (4, 2)\}$

   c.



4. What is the one requirement for a relationship between inputs and outputs to be considered a function?

5. What is the definition of a solution to an equation in one variable?

6. For this problem, set up two functions, one to represent each side of the equation then solve the equation numerically (using the function name in your header), symbolically, and graphically (labeling both graphs using the correct function name). State a conclusion using a full sentence and proper set notation.

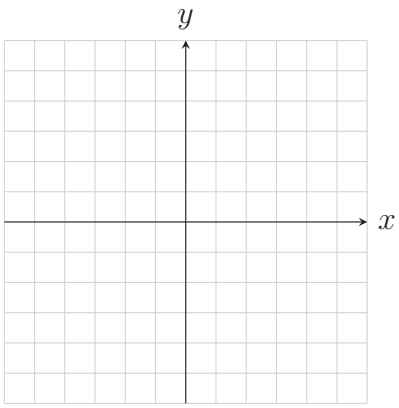
   $x - 2 = -2x + 1$

   i. Numerically:

   ii. Symbolically:

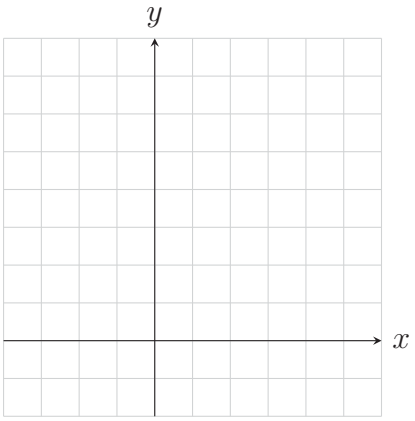
   $x - 2 = -2x + 1$

   iii. Graphically:



7. Solve the following inequality graphically.

   $|-2x + 2| \geq 6$



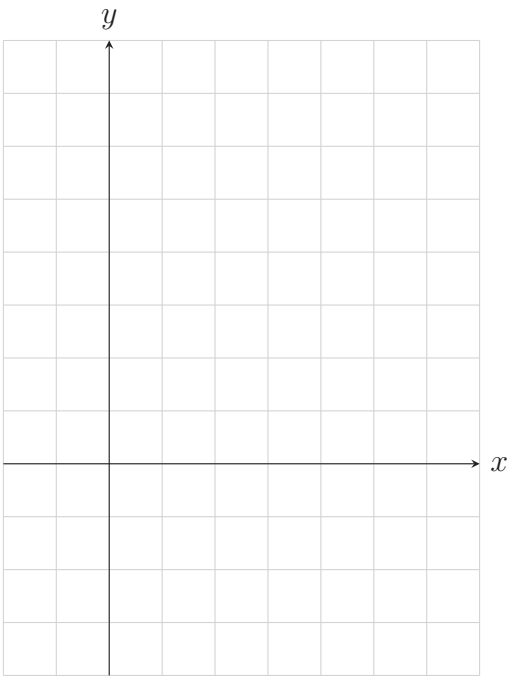
8. For the next problem, set up two or three functions, one to represent each side of the equation then solve the equation numerically (using the function name in your header), symbolically, and graphically (labeling both graphs using the correct function name). State a conclusion using a full sentence and proper set notation.

   $2x - 4 < -2$ or $2x - 4 \geq 6$

   a. Numerically:

   b. Symbolically:

   c. Graphically:



9. Solve the following inequality numerically.

   a. $\left|\frac{2}{3}x - 5\right| < 3$

10. Solve the following equations symbolically.

    a. $|5 - 3x| - 3 = 1$

    b. $|2x| = |x - 3|$

c. $|2x - 5| > -1$

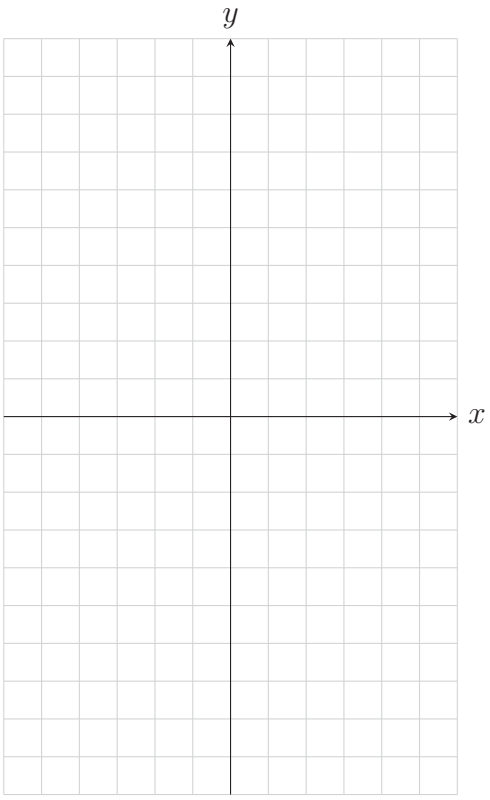
d. $-2|5x - 1| \geq 5$

11. $f(x) = 2x^2 - 4x + 1$

a. Complete the table with the points needed to sketch a graph of $f(x)$. Show your work in the space below.

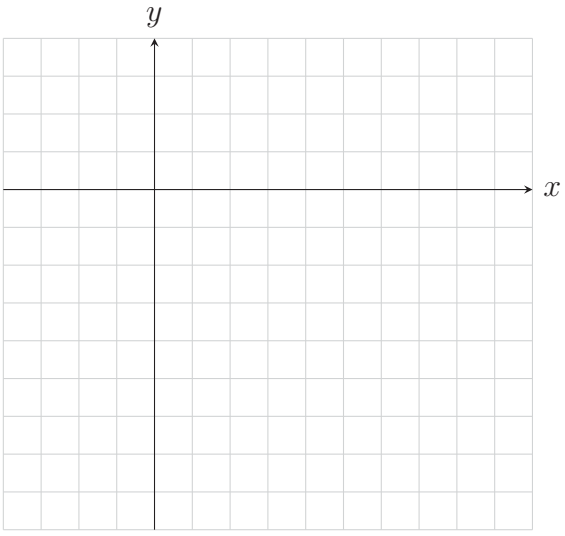
Name of point	x	$f(x)$
Vertex		
y-intercept		
y-int mirrow		
x-intercept		
x-intercept		

b. Graph the function.



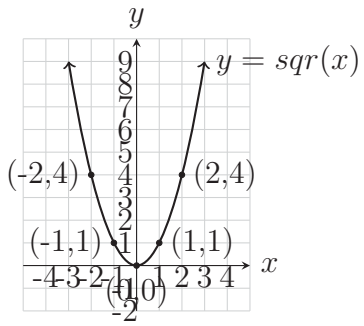
12. Fill in the following table and use the data to graph the function $f(x) = -\frac{1}{2}(x-4)^2 + 1$.

Name of point	x	$f(x)$
y-int Mirror		
Extra Point		
Vertex		
Extra Point		
y-int		

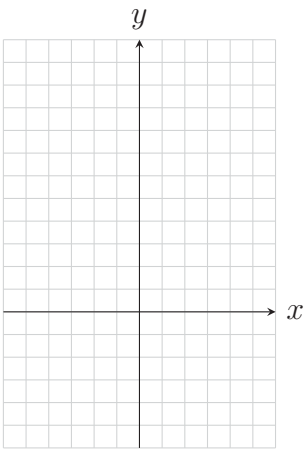


13. Graph the following functions by translating the graph of $sqr(x) = x^2$. Use the 5 key points shown below.

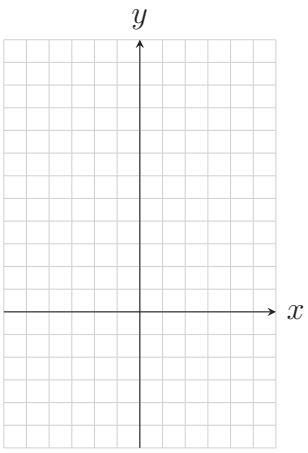
x	$sqr(x)$
-2	4
-1	1
0	0
1	1
2	4



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



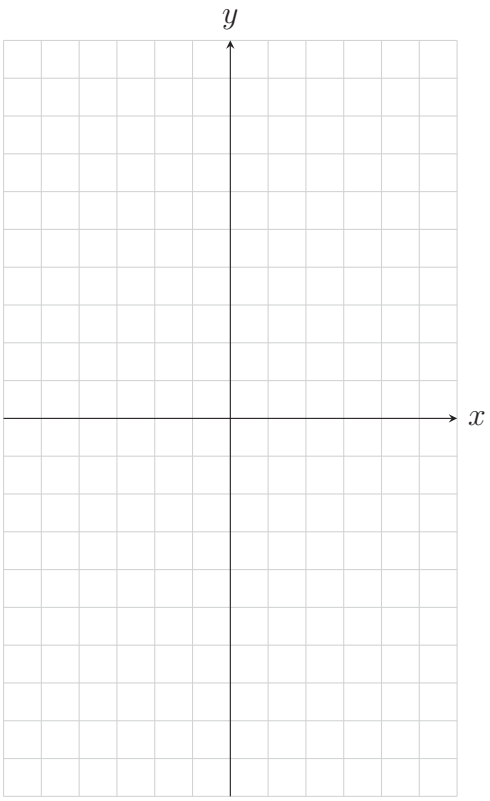
b. $f(x) = (x+3)^2 + 1$



14. Solve $-\frac{1}{2}(x-3)^2+2=0$ numerically, symbolically, and graphically.

a. Numerically:

b. Graphically:



c. Symbolically:

15. Complete the square of the following functions to put them into vertex form. Then state the vertex.

    a. $f(x) = x^2 - 4x$

    b. $f(x) = x^2 - 6x + 5$

    c. $f(x) = 2x^2 - 4x + 1$

    d. $f(x) = -3x^2 - 4x + 1$

16. Solve the following equations symbolically using the completing square method.

    a. $x^2 - 4x + 2 = 0$

    b. $2x^2 + 7x - 5 = 0$

17. Evaluate the discriminant and the state how many real solutions to the equation there must be based upon what number you found when evaluating the discriminant.

a. $\frac{1}{2}x^2 + \frac{3}{2}x + 2 = 0$

b. $2x^2 - x + 3 = 0$

18. Solve the following quadratic equations using the quadratic formula. If your answer is complex, write it in standard complex number form.

a. $2x^2 + 11x - 6 = 0$

c. $x^2 + 2x + 3 = 0$

b. $-3x^2 + 10x - 5 = 0$

d. $-\frac{1}{3}x^2 + x = 2$

19. In a study of the effect of temperature on the growth of melon seedlings, the seedlings were grown at different temperatures, and their heights were measured after a fixed period of time. The findings of this study can be modeled by

$$f(x) = -0.095x^2 + 5.4x - 52.2,$$

where x is the temperature in degrees Celsius and the output $f(x)$ gives the resulting average height in centimeters.

a. Use your calculator to graph $y = f(x)$ and then use the **max** feature of your calculator to determine the maximum height for the melon seedlings and the temperature which results in this greatest height.

b. Solve part (a) symbolically.