1. Look at the graph and find the following:

   a) Domain ________________________________  
   b) Range ________________________________   
   c) Increasing intervals _____________________ 
   d) Decreasing intervals _____________________  
   e) Constant intervals ________________________
   f) x-intercepts ______________________________
   g) y-intercepts ______________________________

2. Determine algebraically whether the relations are symmetric with respect to the x-axis, the y-axis or the origin. Then determine if the relations are even functions, odd functions, or neither.

   a) \( f(x) = \frac{1}{x^5 - 5x} \)  
   b) \( f(x) = \sqrt{3} - x^3 \)  
   c) \( f(x) = 5x^3 + x^2 - 7x + 3 \)  
   d) \( 9 = 2x^2 + 5y^2 \)

3. Find the domain if \( f(x) = \sqrt{1 - x} \).

4. Determine which of the following is a function. 5 point Bonus: Find the x and y intercept of that function.

   (A) \( |y| = 2x + 1 \)  
   B) \( y^2 = x + 3 \)  
   C) \( 4x^2 + 9y^2 = 16 \)  
   D) \( y = \frac{x+4}{3-x} \)
Midpoint = \( \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) \)  
Circle = \( (x - h)^2 + (y - k)^2 = r^2 \)

5. Write the standard form of the equation of a circle having a diameter with endpoints \((-4,4)\) and \((-10,4)\).

6. Write the standard form of the equation of \(x^2 + y^2 - 6x + 10y + 6 = 0\)

Given \(f(x) = 2x + 1\) and \(g(x) = \sqrt{3x - 1}\), find the following. Simplify. State the domain of each function for 2pts each.

Domain \(f(x)\) = _______________, Domain \(g(x)\) = _______________

7. \((f - g)(x)\)

Function  
Domain

8. \(\left(\frac{f}{g}\right)(x)\)

Function  
Domain
Midpoint = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)
Circle = (x - h)^2 + (y - k)^2 = r^2

9. Find \( f(5), f(-3), & f(-2) \) if \( f(x) = \begin{cases} 
5x^2 + 11, & \text{if } x < -2 \\
2, & \text{if } x = -2 \\
-x + 2, & \text{if } x > -2
\end{cases} \)

10. The graph of \( f(x) = x^2 \) is shifted right by 5 units, reflected across the x-axis, and shifted up by 7 units. What is the resulting equation?

11. Describe how the following graph can be obtained from one of the given basic graphs. Indicate in your description which basic graph is used. Write in complete sentences.
\( g(x) = -\sqrt{2x + 3} + 5 \)

12. Make a table to show how the graph of \( g(x) = x^2 \) is transformed by changing the x and y values of the function: Follow the transformations of the given values through the following steps in the order given.

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
<th>x</th>
<th>y</th>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
<td>4</td>
<td>-1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Vertically stretch by a factor of 3; Shift right 2 units; Shift down 5 units

13. Find \( f(-2) \) when \( f(x) = 3x^2 + 2x - 5 \).
Midpoint = \( \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) \)  
Circle = \((x - h)^2 + (y - k)^2 = r^2\)

14. How much fun would it be if you could name and draw the 10 basic functions?

Given \( f(x) = \frac{4}{x+y} \) and \( g(x) = 3x - 1 \), find the following. Simplify. State the domain of each function for 2pts each.

Domain \( f(x) = \) _______________, Domain \( g(x) = \) _______________

15. \((f + g)(x)\)

Function \______________________\n
Domain \______________________\n
16. \((f \cdot g)(x)\)

Function \______________________\n
Domain \______________________\