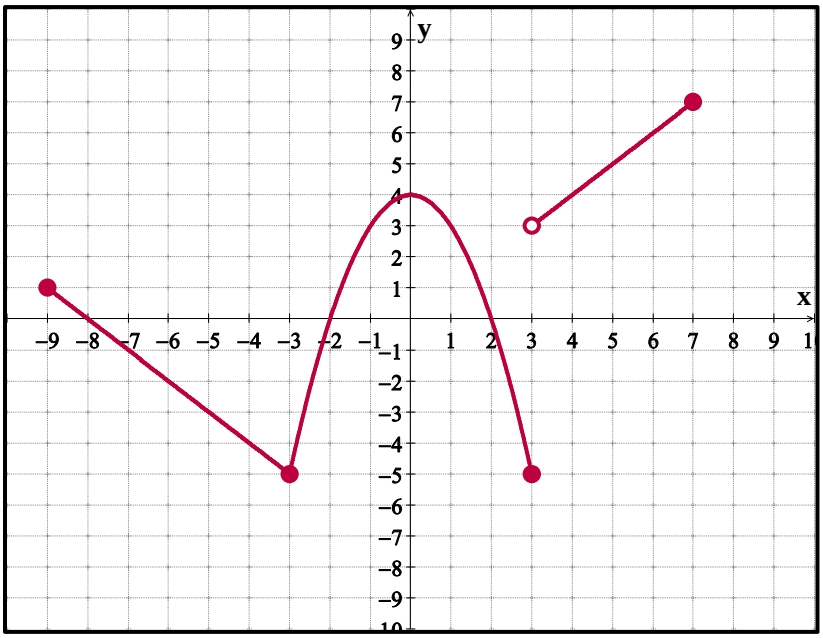
Taking a Closer Look!

Name____**ANSWER**_____

Directions: Determine the stated characteristics for this graph. Carefully draw the graph on the grid below.

Graph:

$$f(x)=\begin{cases} -x-8, & [-9,-3] \\ -x^2+4, & [-3,3] \\ x, & (3,7] \end{cases}$$



1. Is it a function? Yes
Passes vertical line test.

2. Is the inverse a function? No
Fails horizontal line test.

3. Domain: [-9,7]

4. Range: [-5,7]

5. *x*-intercept(s): {-8, -2, 2}

6. *y*-intercept(s): {4}

7. Where is the graph increasing?
$[-3,0]\cup(3,7]$

8. Where is the graph decreasing?
$[-9,-3]\cup[0,3]$

9. Where is the graph negative?
$(-8,-2)\cup(2,3]$

10. Where is the graph positive?
$[-9,-8)\cup(-2,2)\cup(3,7]$

11. Where is $y = 0$? {-8, -2, 2}

12. Symmetry: Overall – none.
Symmetric with *y*-axis on [-3,3]

13. Find y when $x = 3$. -5

14. For what *x*-value(s) is $y = 3$? {-1, 1}

15. Maximum value of graph: 7
(absolute maximum)

16. Minimum value of graph: -5
(absolute minimum)

17. Relative maximum at $x =$ ___0_____.

Assuming $y = f(x)$:

18. As $x \to 7$, $f(x) \to$ __7__.
As $x \to -9$, $f(x) \to$ _1__.

19. Name given to this graph:
Piecewise-defined Function