

**Algebra 1 – Critical Parts of Graphs**  
**Homework – Max/Mins of Equations**


Name \_\_\_\_\_  
 Teacher \_\_\_\_\_ Block \_\_\_\_\_

Determine if the graph of each function opens up or down. Draw a quick "sketch" of the graph.


1.  $y = -x^2$

DOWN 

2.  $f(x) = -2|x+3|$

DOWN 

3.  $f(x) = (x-1)^2 - 5$

UP 

4.  $y = 3^x$

UP 


5.  $y = \frac{1}{2}|x| - 4$

UP 

6.  $y = -0.5(3.2)^{x+4}$

DOWN 

7.  $y = 2x^2 - 5$

UP 

8.  $y = 0.5^x - 1$

UP 

Determine if the graph of each function has a max or a minimum value. Circle the correct answer.

9.  $y = 2|x+2|$

Max or Min

10.  $y = -4(0.8)^x - 1$

Max or Min

11.  $y = -0.5(x+4)^2 + 3$

Max or Min

12.  $y = \left(\frac{1}{3}\right)^{x-1}$

Max or Min

Find the maximum and minimum value of each function. If it doesn't have one, write "none".

13.  $y = 2x - 5$

Max NONE

Min NONE

14.  $y = -3(x+4)^2 - 2$

Max -2

Min NONE

15.  $y = 0.5(3)^x + 4$

Max NONE

Min 4

16.  $y = -2|x| - 3$

Max -3

Min NONE

17.  $2x - 5y = 4$

Max NONE

Min NONE

18.  $y = -2\left(\frac{1}{2}\right)^{x+9} + 1$

Max 1

Min NONE

19.  $f(x) = (x+2)^2 + 3$

Max NONE

Min 3

20.  $f(x) = -|x| - 3$


Max -3

Min NONE

21.  $f(x) = |x-3| + 2$


Max NONE

Min 2

22.  $y = x^2$  

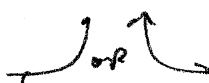
Max NONE

Min 0

23.  $y = |x|$  

Max NONE

Min 0

24.  $y = 5^x$  

Max NONE

Min 0

Is each statement "sometimes true", "always true", or "never true"? Circle the correct answer.

25. A linear function has a maximum or a minimum. Always / Sometimes /  Never *or sometimes?*

26. A quadratic function that opens up has a maximum value. Always / Sometimes /  Never

27. An absolute value function with a positive 'a' value has a minimum.  Always / Sometimes / Never

28. An exponential function that increases has a minimum. Always /  Sometimes / Never

29. Given the equation  $ax + by = c$ , if the 'a' is positive the graph has a minimum.  
Always / Sometimes /  Never

30. A single quadratic graph has **both** a maximum and a minimum value. Always / Sometimes /  Never

31. A graph that has **no** maximum value is the same as having a maximum value of 0.  
Always / Sometimes /  Never