

**Greatest Integer Function Worksheet** Name \_\_\_\_\_

**Evaluating Greatest Integer Expressions**

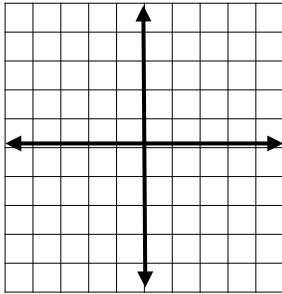
Evaluate the following:

- (1)  $\lceil 7.1 \rceil =$  \_\_\_\_\_ (2)  $\lceil 1.8 \rceil =$  \_\_\_\_\_ (3)  $\lceil \pi \rceil =$  \_\_\_\_\_  
(4)  $\lfloor -6.8 \rfloor =$  \_\_\_\_\_ (5)  $\lfloor -2.1 \rfloor =$  \_\_\_\_\_ (6)  $\lfloor 0 \rfloor =$  \_\_\_\_\_

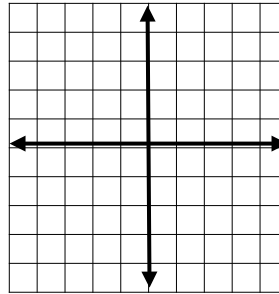
**Translating Graphs of Greatest Integer Functions**

Using what you learned about the translations of  $y = a|b(x - h)| + k$ , graph the following:

(7)  $f(x) = \lceil x \rceil + 2$

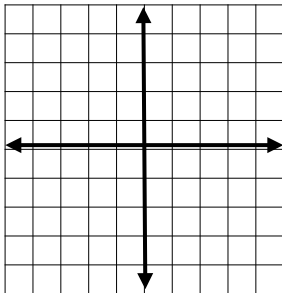


$g(x) = \lceil x + 2 \rceil$

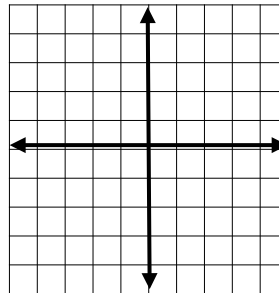


Explain the shift in each graph and how they differ. \_\_\_\_\_

(8)  $f(x) = 2\lceil x \rceil$

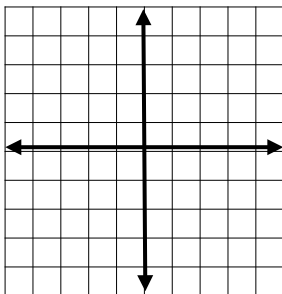


$g(x) = \lceil 2x \rceil$

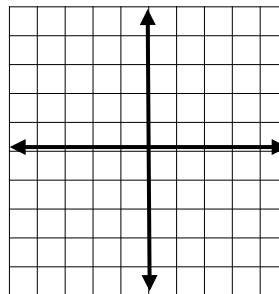


Explain the dilation in each graph and how they differ. \_\_\_\_\_

(9)  $f(x) = -\lceil x \rceil$



$g(x) = \lceil -x \rceil$



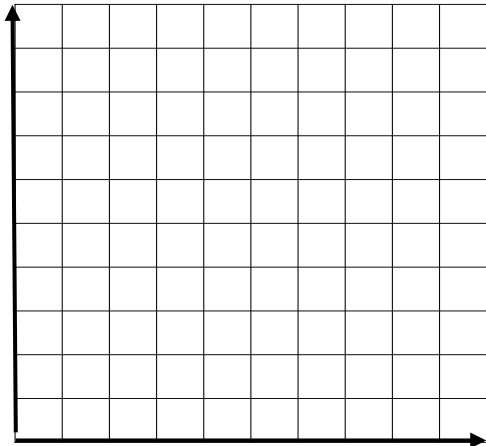
Explain the reflection in these graphs and how they differ. \_\_\_\_\_

**Real World Application of Step Functions**

Prior to September, 2000, taxi fares from Washington DC to Maryland were described as follows: \$2.00 up to and including  $\frac{1}{2}$  mile, \$0.70 for each additional  $\frac{1}{2}$  mile increment.

(10) Describe the independent and dependent variables and explain your choices. \_\_\_\_\_

(11) Graph the fares for the first 2 miles: (*Make sure to label the axes.*)



(12) Write the piecewise function for 0 to 2 miles.

$$f(x) = \left\{ \begin{array}{l} \end{array} \right.$$

(13) Discuss why this is a step function and it is different from the greatest integer parent function

$$f(x) = \llbracket x \rrbracket$$

