Step Functions Worksheet

1) Rewrite $f(x) = [\![x]\!]$ as a piecewise linear function from $6 \leq x < 8$.

2) Evaluate

a) $[\![5.7]\!] =$

b) $2[\![\sqrt{5}]\!] =$

c) $[\![3\pi]\!] =$

d) $[\![-6.1]\!] =$

e) $[\![0.2]\!] =$

f) $5[\![-9.1]\!] =$

3) Sketch the graph of
$f(x) = [\![x]\!]$ from $-4 \leq x < 4$
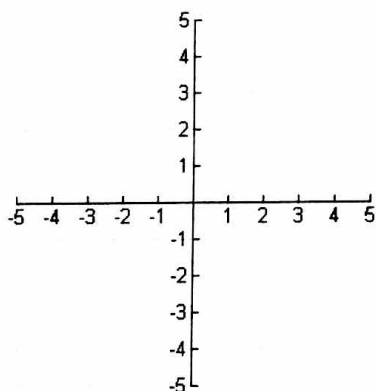
4) Sketch the graph of
$f(x) = 3[\![x]\!]$ from $-2 \leq x < 2$
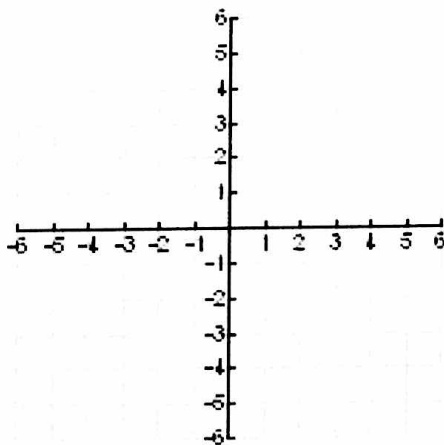
5) Sketch the graph of
$f(x) = 2 - [\![x]\!]$ from $0 \leq x < 5$
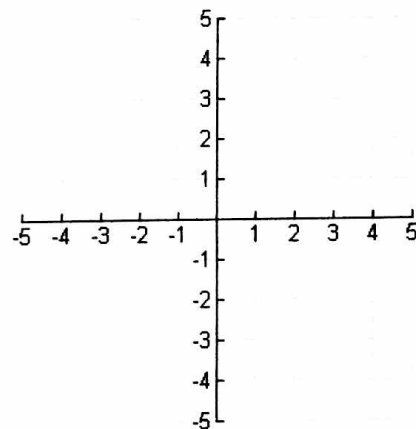
You are selling candy bars. The taxable amounts and tax imposed up to $1 are shown below.

- For amounts between $0.01 and $0.20, the tax is $.01.

- For amounts greater than $0.20 and less than or equal to $0.40, the tax is $0.02.

- For amounts greater than $0.40 and less than or equal to $0.60, the tax is $0.03.

- For amounts greater than $0.60 and less than or equal to $0.80, the tax is $0.04

- For amounts greater than $0.80 and less than or equal to $1.00, the tax is $0.05.

6) Complete the graph to show the tax imposed on the candy bars.

A Tax Table for Amounts up to
$1

Taxable Amount
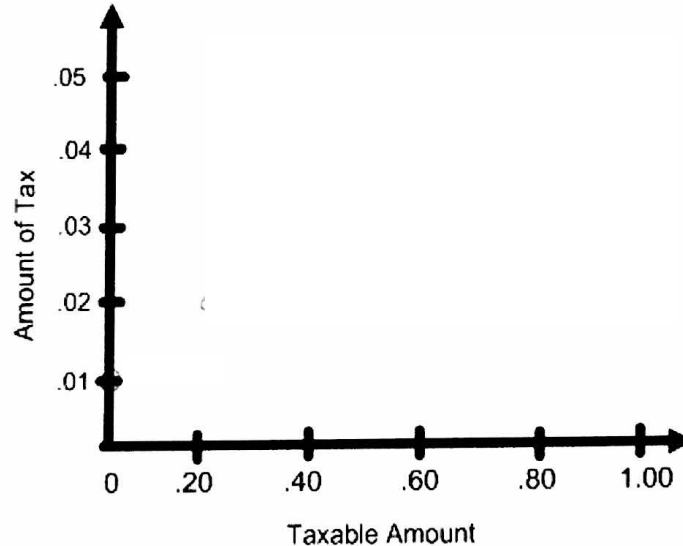
Use the graph to answer the following questions:

7) A candy bar costs $0.55. What is the total cost with tax?

8) Your aunt purchased three candy bars at $0.55 a piece. What is the total cost with tax?

9) Someone purchased 4 candy bars at $0.55 a piece. They gave you $2 and a quarter. Is this enough money to cover the candy bars and the tax? Explain your answer.

11. A store will deliver a sofa for $3.00 per mile including fractions of a mile. (For example, 25.5 miles is $3(25) = $75.) There is no charge within the first mile. Use the greatest integer function to express C, the delivery cost, as a function of x, the number of miles from the store. Sketch a graph of this function for $0 \le x \le 5$.

Make a table of values and sketch the graph of the resulting function.
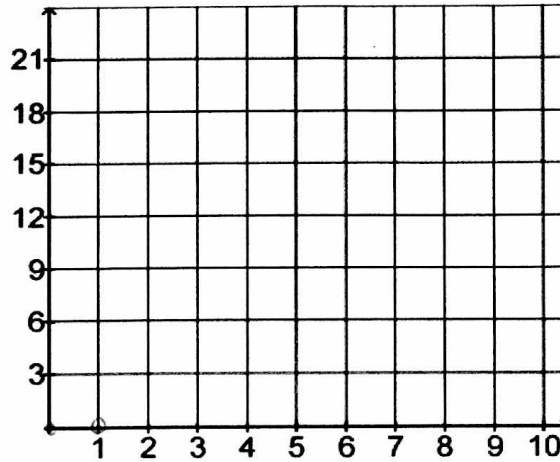
Function: _____

12. The cost of sending an overnight package from College Station to Dallas is $10.00 for a package under one pound and $2.50 is added at one pound and each additional whole pound. Use the greatest integer function to create a model for the cost C of overnight delivery of a package weighing x pounds. Sketch the graph for packages up to 7 pounds.

Make a table of values and sketch the graph of the resulting function.
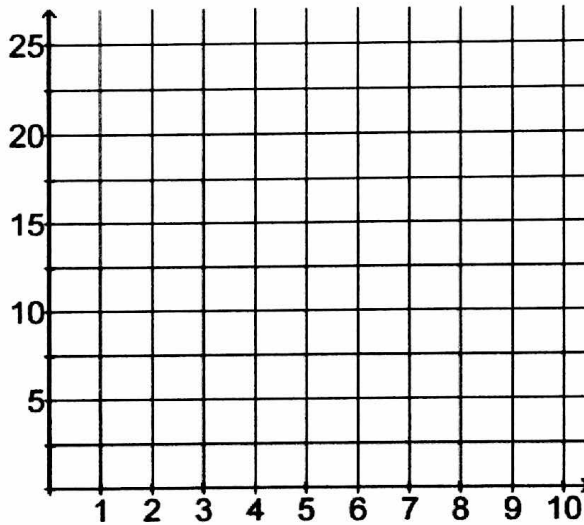
Function: _____

Find the cost of sending a 15 pound 9 ounce package.