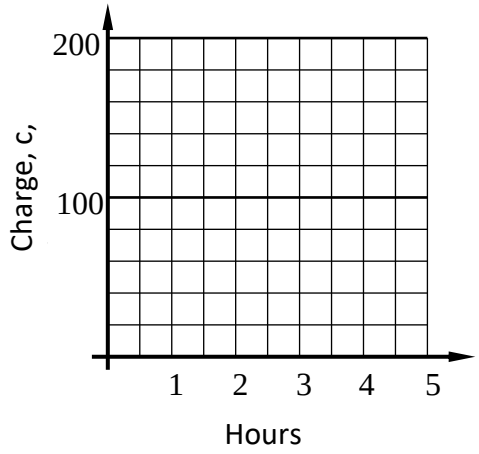
Name: Date: Period:

1. An electrician works at a job site at a rate of $40 per hour or any portion of an hour. In other words, he will charge you $40 as soon as he comes up to the first hour, and then $40 for the second hour, etcetera.

   [a] Graph the amount the electrician charges, *c*, in dollars as a function of the number of hours he works.



   [b] How much does he charge for working 3.5 hours? Circle the point on the graph the shows this answer.

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2. A step function is defined using the piecewise formula:

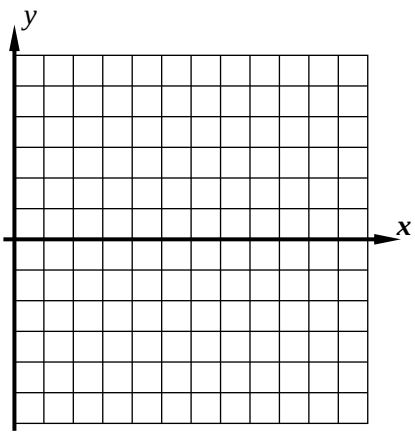
$$f(x) = \begin{cases} 2 & 0 \le x < 3 \\ 5 & 3 \le x < 5 \\ -4 & 5 \le x \le 10 \end{cases}$$

   Evaluate the following:

   [a] f(2.7) = [b] f(5) =

   [c] f(3.5) = [d] f(0) =

[e] Graph f(x) on the grid to the right.



[f] State the domain and range of this function using set notation.
Domain: Range:

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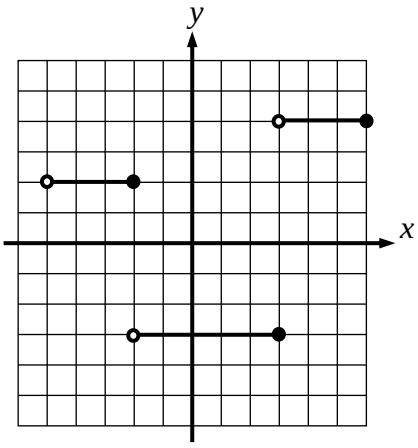
3. The step function g(x) is shown on the grid to below. Answer the following questions.



   Evaluate the following:

   [a] f(-4) = [b] f(-2) =

   [c] f(2) = [d] f(5) =

[e] Ji Hwan states that the range of this function is $-3 \le y \le 4$.
Is he correct? Why or why not.

[f] Write an equation for this step function.

4. Stewart International Airport in Newburgh, New York charges for parking the way many airports do, by the partial hour. Their short-term parking rates are shown to the right. Write and graph a **step function** below based on the number of hours you park.

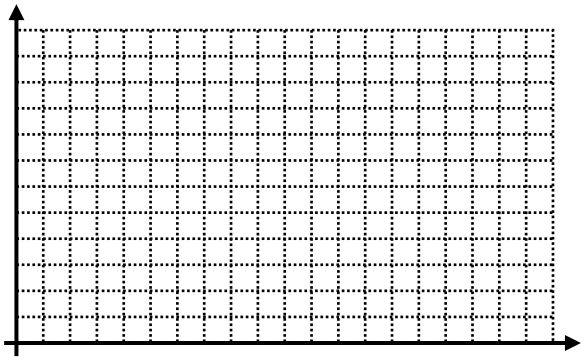
Stewart International Airport Rates & Information

Parking Lots and Rates at SWF Airport (including tax)

1 hr or part thereof	$3
Each additional hour or part thereafter*	$3
24-hr maximum	$30

*charges are incurred in hour increments before reaching the daily max

$y =$ { _____ If, _____ (×10)



[b] How much would you have to pay if you parked for 5 hours and 22 minutes? Show how you determined your answer.

[c] After how many hours of parking will you hit the maximum charge of $30? Explain your reasoning.

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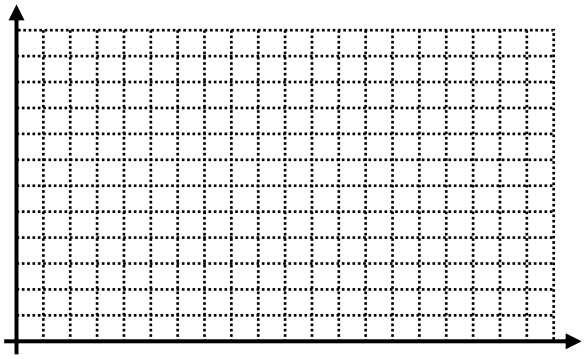
5. A postal service charges $4 for shipping any package weighing up to but not including 1 pound and $1 for each additional pound or portion of a pound up to but not including 5 pounds. Packages 5 pounds or over have different rates. Write and graph a step function that shows the relationship between the number *x* of pounds a package weighs and the total cost *y* for postage.



$y =$ { _____ if _____ (×5)

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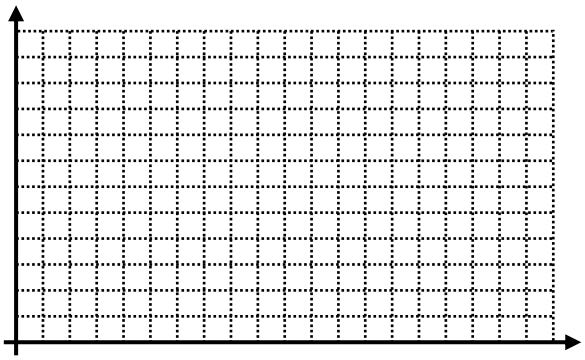
6. A wholesale t-shirt manufacturer charges the following prices for t-shirt orders. Write and graph a step function illustrating the charges. You order 40 shirts and must pay shipping fees of $10. How much is your total order?

$20 per shirt for shirt orders up to 20 shirts.
$15 per shirt for shirt between 21 and 40 shirts.
$10 per shirt for shirt orders between 41 and 80 shirts.
$5 per shirt for shirt orders over 80 shirts.



$y =$ { _____ if _____ (×4)