**Back to Warm Up ☺**

Your favorite dog groomer charges according to your dog’s weight.  If your dog is 15 pounds and under, the groomer charges $35.  If your dog is between 15 and 40 pounds, she charges $40.  If your dog is over 40 pounds, she charges $40, plus an additional $2 for each pound.

1. Graph the function.



Go back to your original graph and compare your answer to the answer
we just did together.

1. Were there any similarities in your first graph and the piecewise
function graph? What were they? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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2. Were there any differences in your first graph and the piecewise function graph? What were they?

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**Graphing Piecewise Functions**

1. f(x) = x2 + 1, x ≥ -1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ -3x – 1, x < -1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**STEPS:**
1. Determine the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the graphs.
2. Draw the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of each graph (Draw the fences.)
3. Draw each \_\_\_\_\_\_\_\_\_\_\_\_\_. (Draw each neighbor on his side of the fence.)

4. Draw \_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_ circles. (Who owns the fence?)

Continuous or Discontinuous?

1. f(x) = 3x + 2, x < -2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

-x, -2 < x < 1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

x2 – 2, x >1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
1. Determine the shapes of the graphs.
2. Draw the boundaries of each graph (Draw the fences.)
3. Draw each graph. (Draw each neighbor on his side of the fence.)

4. Draw open or closed circles. (Who owns the fence?)

Continuous or Discontinuous?

**Step Functions**

A piecewise function that is constant for each interval of its domain, such as the ticket price function, is called a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**. Basically the graph looks like a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. You can describe piecewise functions with a function rule. See the example below:

f(x) = 5, 0 < x < 13

9, if 13 < x < 55

6.5, if x > 55

*Read this as:*

 “f of x is \_\_\_\_\_\_\_\_\_\_\_ if x is \_\_\_\_\_\_\_\_\_\_\_\_\_ than 0 and less than \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_ if x is greater than or \_\_\_\_\_\_\_\_\_\_\_\_to 13 and less than \_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_if x is greater than or equal to \_\_\_\_\_\_\_\_\_\_\_\_\_\_.”

**Graphing Step Functions**

Graph the step function below:



Closed circle: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

-6

if x < -2

Open circle: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7

-1

If -2 ≤ x < 4

if x ≥ 4

**PRACTICE PROBLEMS** Carefully graph each of the following. Identify whether each function is continuous or discontinues. Then evaluate the function at each specified domain value (x). You can also make a table of x- & y- values to help you.

1. 

Continuous or discontinuous?

f(3) =

f(-4) =

f(-2) =

1. *f(x)* = 

Continuous or discontinuous?

f(-2) =

f(0) =

f(5) =