Name _____
Pd _____ Date _____

n	$T(n)$
1	4.5
3	5.5
4	6
6	7
7	7.5
8	8
10	9
12	10
13	10.5
14	11
16	12
19	13.5

While talking about his math class, Charles notices that there seems to be a pattern for how long it takes him to do his homework problems, given how many problems he is assigned. He makes a table for the amount of time in minutes T, based on the number of homework problems, n.

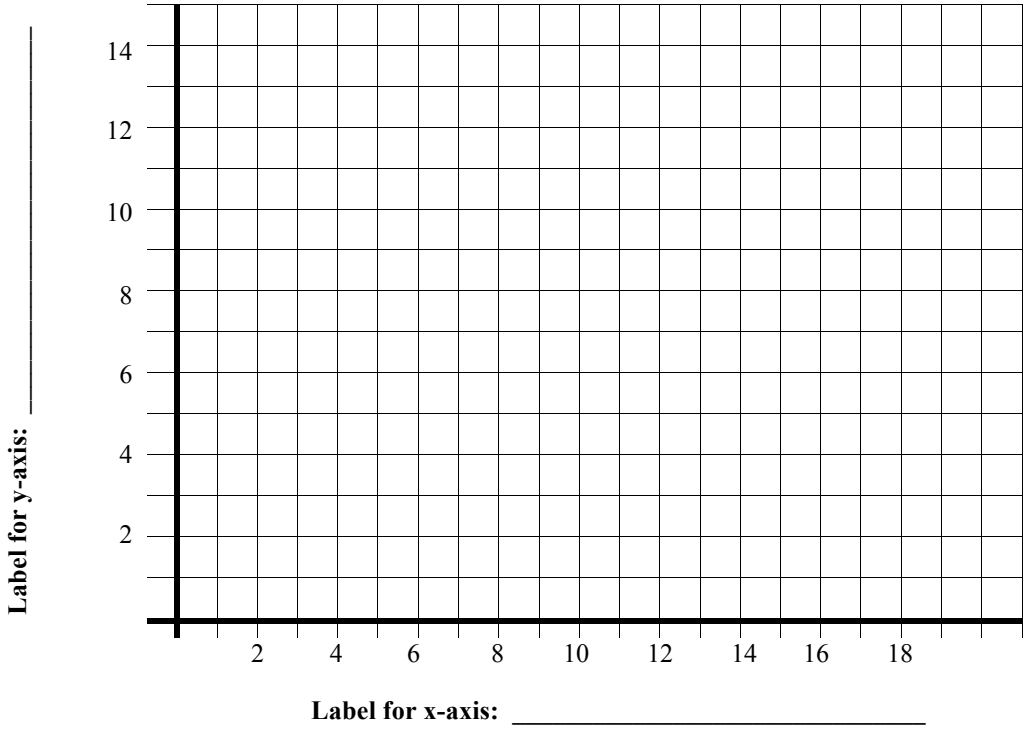
1. What does $T(10)$ represent (in context, not its value)?

2. What is the value of $T(10)$? (including units)

3. What would it mean if 12 showed up twice in the n column? Would this make sense?

4. What would it mean if 15 showed up twice in the $T(n)$ column? Would this make sense?

5. Graph the points from the table above (and LABEL THE AXES) in the coordinate plane below.



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6. Do you think that it makes sense to connect the points? Why or why not?

7. Using your graph, approximately what would you expect to find for $T(5)$.

8. What are some of the advantages to having the graph?

9. A website shows the official daily high temperature in Honolulu for 2012 in a table of values and also represents the data in a graph. Which representation (table or graph) do you think it would be easiest to see that the temperatures increase in general during the summer and decrease in the winter? Explain.

10. For the same daily high temperatures described in the problem above, which representation (table or graph) do you think it would be easiest to find the official high Temperature on January 30, 2012? Explain.

11. For the same temperatures described in the problem above, which representation (table or graph) do you think it would be easiest to find all the days where the official high Temperature exceeded 85 degrees? Explain.

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When is a plot not the graph of a function?

For his birthday, Chaz wants to treat his friends to a day at Game-O-Rama, the local arcade. Since Chaz is on a budget, he needs to figure out how much this party would cost. So, when he calls Game-O-Rama, the manager tells him that they have special group pricing for birthday parties. The manager emails him the following cost sheet, where x is the number of friends he brings and C(n) is the cost of the party.

x	$C(x)$
1	20
2	25
3	30
4	30
5	35
6	35
7	35
8	40
9	40
10	40
11	40
12	45

1. How much would it cost to bring 6 of his friends?

2. How much would it cost to bring 7 of his friends?

3. How much would it cost to bring 8 of his friends?

Notice that it costs the same amount to bring 6 friends as it does to bring 7 friends (isn't group pricing great!). Thus, $C(6) = C(7)$, and the number 35 appears multiple times in the $C(x)$ column.

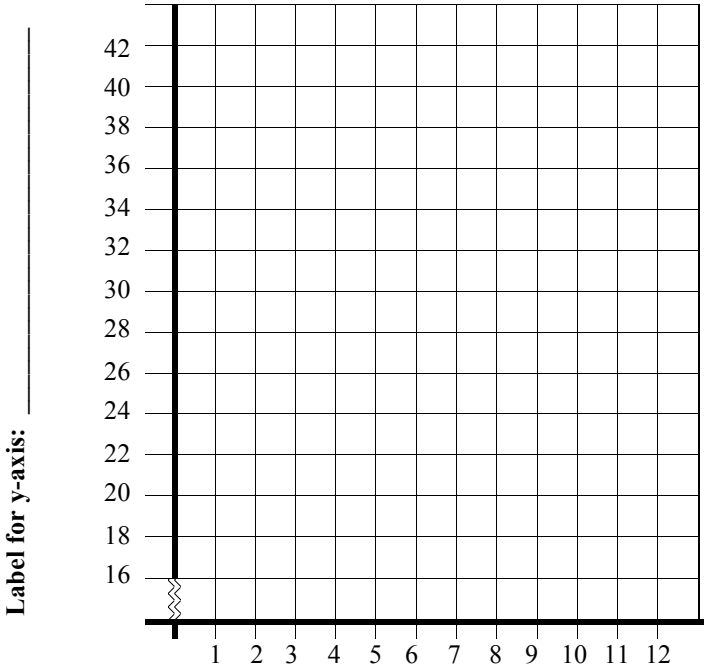
Name _____
Pd _____ Date _____

Now, let's explore what would happen if the same number appeared twice **in the *x* column**? For example, what if the table of values in Game-O-Rama cost sheet included the following rows:

x	$C(x)$
13	45
13	50

4. If this were included in the cost sheet, what would be the cost for bringing 13 friends? Why would this be confusing to Chaz?

5. On the coordinate plane below, label the axes and plot the points from the original table of values.



x	$C(x)$
1	20
2	25
3	30
4	30
5	35
6	35
7	35
8	40
9	40
10	40
11	40
12	45

Notice that on your graph there are never two points with the same first coordinate. Therefore, no two points lie on the same vertical line.

6. In your graph, include the two additional points when $x = 13$. What do you notice now about the graph (about how the graph looks when $x = 13$)?

x	$C(x)$
13	45
13	50

Name _____
Pd _____ Date _____

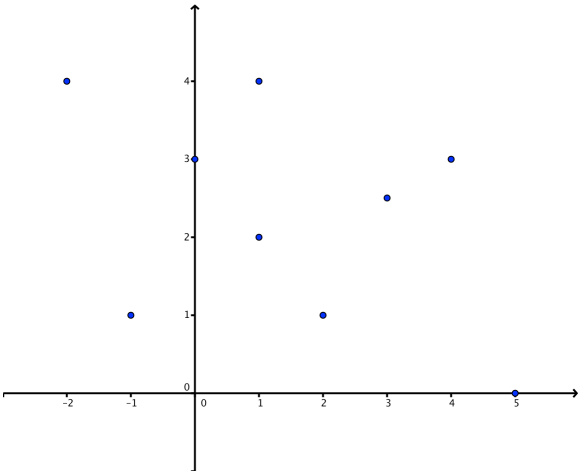
When we plot a table of values, in order for the graph to represent an actual **function**, there CANNOT be more than 1 point graphed at each ***x*** value.

- When you plotted the values for ***x*** = 1 to ***x*** = 12, the graph represented a function.
- However, when you plotted the values for ***x*** = 13, the graph no longer represented a function.

To check if a graph actually represents a function, in your mind, picture the graph with several vertical lines drawn on it. If any vertical line touches the graph more than once, it does not represent a function. This is called the ***vertical line test****.*

Explain why the following are not graphs of functions. It may help to draw the vertical line that fails the *vertical line test*.

7.



8.