Name:________________

Piecewise Function Notes

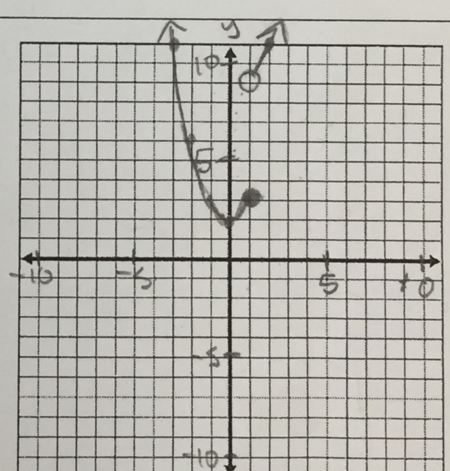
Consider the function $g(x) = \begin{cases} x^2 + 2 & \text{for } x \le 1 \\ 2x + 7 & \text{for } x > 1 \end{cases}$

Complete the tables for $g(x)$ below.

For $x \le 1$	
x	$g(x) = x^2 + 2$
–5	$(-5)^2+2=27$
–4	$(-4)^2+2=18$
–3	$(-3)^2+2=11$
–2	$(-2)^2+2=6$
–1	$(-1)^2+2=3$
0	$(0)^2+2=2$
1	$(1)^2+2=3$

For $x > 1$	
x	$g(x) = 2x + 7$
1	$2(1)+7=9.$
2	$2(2)+7=11$
3	$2(3)+7=13$
4	$2(4)+7=15$
5	$2(5)+7=17$
6	$2(6)+7=19$
7	$2(7)+7=21$

Using your table, make a careful sketch of the graph $y = g(x)$. Recall the use of open circles to indicate that an endpoint *is not* included and closed circles to indicate that an endpoint *is* included. At which points will the open and closed circles be located on this graph?



What are the domain and the range of this function?

Domain: $\mathbb{R}$

Range: $y \geq 2$

Is the piecewise function continuous? Why or why not?

This function is not continuous because you have to pick up your pencil to continue drawing the graph at $x=1$. We also see if we evaluate $g(1)$ for each equation you get different values.

Name:________________

Piecewise Function Notes

Let $f(x) = \begin{cases} x^2+2 & \text{for } x \le 2 \\ \frac{1}{2}x+5 & \text{for } x > 2 \end{cases}$

Complete the tables below for $f(x)$.

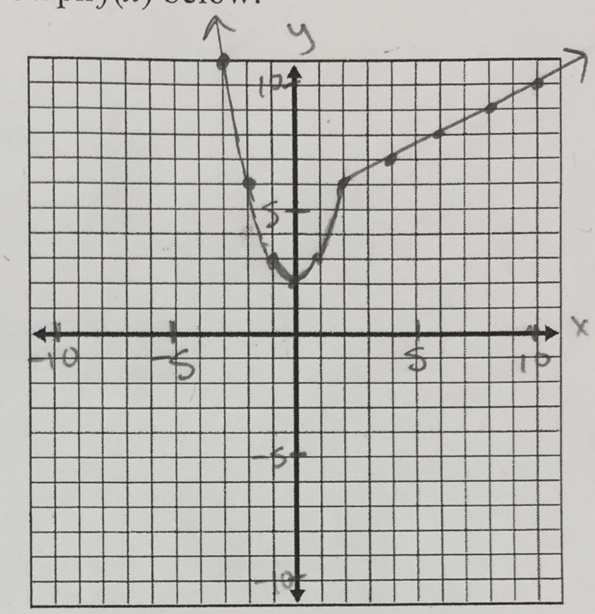
for $x \le 2$

x	f(x)
-3	11
-2	6
-1	3
0	2
1	3
2	6

for $x > 2$

x	f(x)
2	6
4	7
6	8
8	9
10	10

Graph $f(x)$ below:



State the domain and range of $f(x)$.

Domain: $\mathbb{R}$

Range: $y \geq 2$

Is the function continuous? Why or why not?

This function is continuous because you do not have to pick up your pencil to completely draw the graph also f(2) = 6 for both equations and that would be where the function breaks

Completely describe the function $f(x)$.

- No x-intercepts
- y-intercept: (0,2)
- curved for $x \leq 2$ ← (parabola shape)
- linear for $x > 2$
- Domain & Range stated above
- Decreasing $x < 0$
- Increasing $x > 0$
- Function
- Minimum $y = 2$
- opens up for parabola portion