1. Use the piecewise function to evaluate the following.

$$f(x) = \begin{cases} \frac{3}{x-2}, & x < -3 \\ 2x^2 - 3x, & -3 < x \le 6 \\ 8, & x > 6 \end{cases}$$

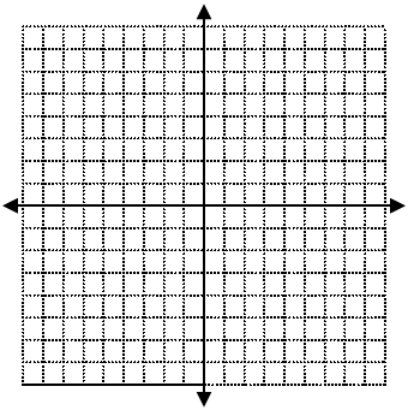
a. $f(-1) =$ b. $f(-4) =$

c. $f(9) =$ d. $f(6) =$

e. $2f(-1) + 3f(7) =$

2. Graph the following piecewise function.

$$f(x) = \begin{cases} -\frac{1}{3}x - 2, & x \le 0 \\ \frac{1}{2}x + 1, & x > 0 \end{cases}$$



3. **NUMERICALLY** Use the piecewise function to fill in the table.

$$f(x) = \begin{cases} -x + 4, & x \le 0 \\ -3x + 18, & x > 0 \end{cases}$$

x	*f(x)*
-2	
0	
1	
	-12
	9

4. When a diabetic takes long-acting insulin, the insulin reaches its peak effect on the blood sugar level in about three hours. This effect remains fairly constant for 5 hours, then declines, and is very low until the next injection. In a typical patient, the level of insulin might be modeled by the following function.

$$f(t) = \begin{cases} 40t + 100 & \text{if } 0 \le t \le 3 \\ 220 & \text{if } 3 < t \le 8 \\ -80t + 860 & \text{if } 8 < t \le 10 \\ 60 & \text{if } 10 < t \le 24 \end{cases}$$

Here, $f(t)$ represents the blood sugar level at time t hours after the time of the injection. If a patient takes insulin at 6 am, find the blood sugar level at each of the following times.

a. 7 am b. 11 am c. 3 pm d. 5 pm

5. Application problem! Sully's blood pressure changes throughout the school day. Let x represent the time since 8:00AM (so, 10:00 AM would be $x = 2$, 1:00PM would be $x = 5$); use the following information to write a piecewise function that represents Sully's BP throughout the day.

a. Sully's BP starts at 90 and rises 5 points every hour for the first four hours.

b. Sully does yoga from 12-1 and maintains a BP of 110.

c. Sully's Honors math class meets from 1-3 and so his BP rises from 110 at 10 points per hour.

d. Sully heads home and relaxes so that his BP begins dropping at 2 points per hour until his 8PM bedtime.