A Piecewise Halloween

Name: _____

Today you will be drawing a very creepy scene with these very scary equations!
But they're not so scary, really.

First, you're going to set the scene by graphing the mandatory equations below. Next, you will graph a bit more but you'll get to choose between a few options. Then, you'll draw your own Halloween-y picture and write the equations to represent it!

1. MANDATORY EQUATIONS - *Graph the following:*

$(x-18)^2+(y-18)^2=9$

$$r(x)=\begin{cases}\frac{3}{5}x+18, & -7\le x\le 0\\ -\frac{3}{5}x+18 & 0\le x\le 7\end{cases}$$

$x=5\ for\ 0\le y\le 15$

$x=-5\ for\ 0\le y\le 15$

$x=2\ for\ 0\le y\le 5$

$x=-2\ for\ 0\le y\le 5$

$d(x)=5\ for\ -2\le x\le 2$

$$w(x)=\begin{cases}0 & -5\le x\le 5\\ 2x+10 & -10\le x\le -5\\ -2x+10 & 5\le x\le 10\end{cases}$$

$x=-2\ \ for\ \ 11\le y\le 17$

$(x+2)^2+(y-11)^2=0.5^2$ ***color in this circle with black!

$$k(x)=\begin{cases}-\frac{1}{2}x+10 & -4\le x\le -2\\ \frac{1}{2}x+12 & -2<x\le 0\end{cases}$$

$l(x)=11\ \ for\ -4\le x\le 0$

$$m(x)=\begin{cases}\frac{1}{2}x+12 & -4\le x\le -2\\ -\frac{1}{2}x+10 & -2<x\le 0\end{cases}$$

$$n(x)=\begin{cases}x+13 & -4\le x\le -2\\ -x+9 & -2<x\le 0\end{cases}$$

2. CHOOSE ONE OPTION BELOW *to graph. Optionally, you may graph the other one for extra credit ☺:*

Option 1

$(x+13)^2+(y-16)^2=1$

$$b(x)=\begin{cases}-|x+17|+17 & -18\le x\le -16\\ -|x+15|+17 & -16< x\le -14\\ -|x+11|+17 & -12\le x\le -10\\ -|x+9|+17 & -10< x\le -8\end{cases}$$

Draw the parabola with vertex at $(-10,18)$ and a point on the parabola at $(-8,16)$ with restricted domain $-12\le x\le -8$. Then write the equation of the parabola. Note, you will have to find the value of a!

Draw the parabola with vertex at $(-16,18)$ and a point on the parabola at $(-18,16)$ with restricted domain $-18\le x\le -14$. Then write the equation of the parabola. Note, you will have to find the value of a!

Option 2

$(x-13.5)^2+(y-10.5)^2=0.5^2$

$(x-14.5)^2+(y-10.5)^2=0.5^2$

$g(x)=-(x-14)^2+12$

$$s(x)=\begin{cases}-|x-12|+4 & 11\le x\le 13\\ -|x-14|+4 & 13< x\le 15\\ -|x-16|+4 & 15< x\le 17\end{cases}$$

3. DRAW YOUR OWN Halloween-themed picture! Then WRITE THE EQUATIONS for your picture below: