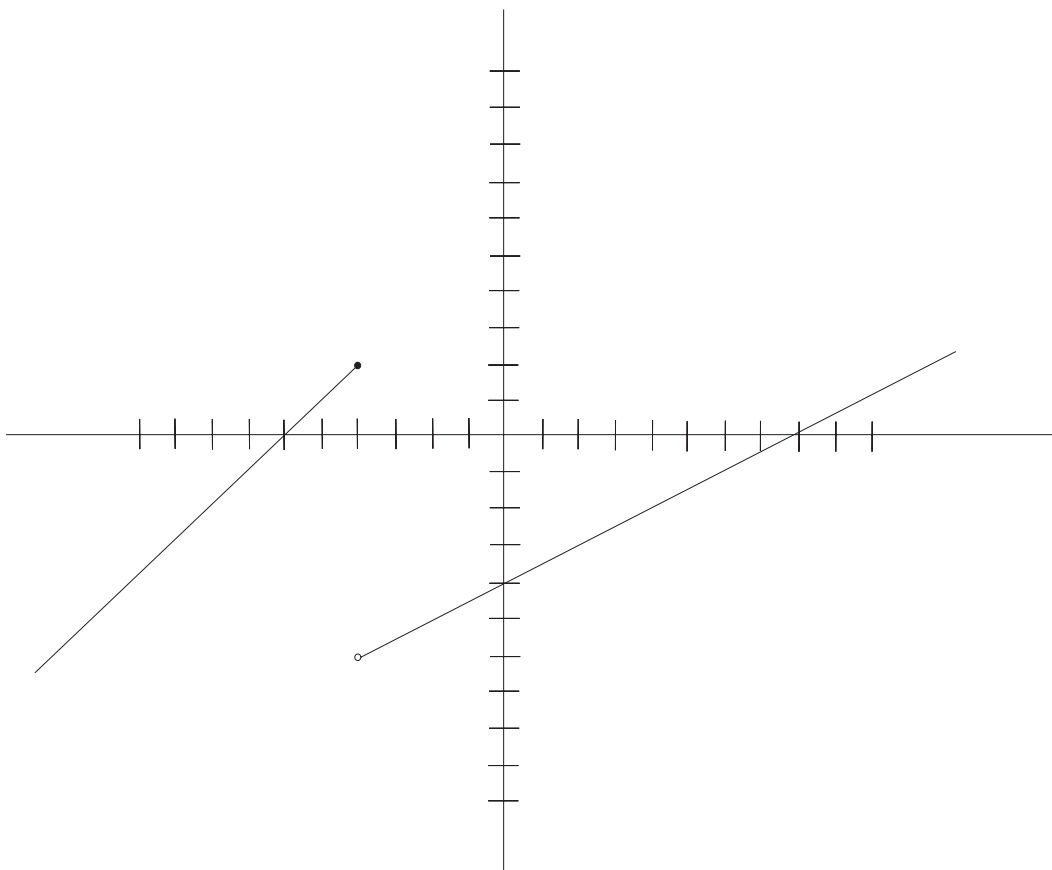


44. Graph the function $g(x) = \begin{cases} x + 6 & x \leq -4 \\ \frac{1}{2}x - 4 & x > -4 \end{cases}$

The domain of $\frac{1}{2}x - 4$ is $x > -4$, so we plot a hollow circle at $(-4, -6)$.



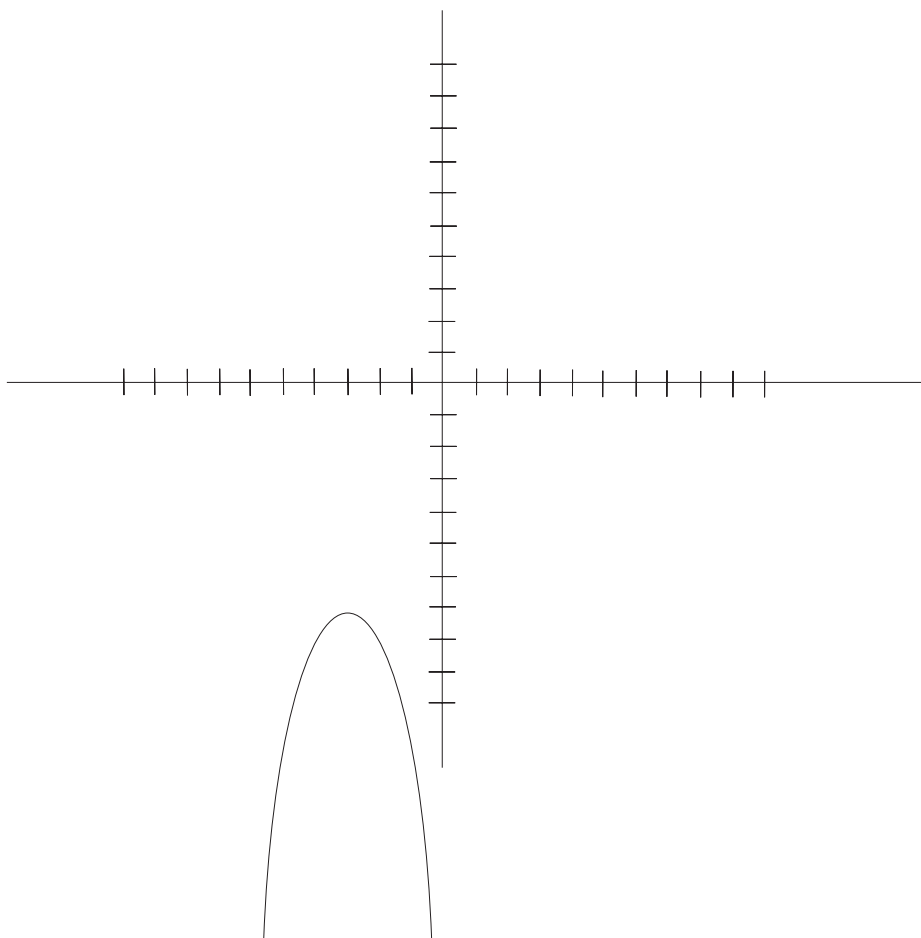
40. Write an equation for the function that has the same shape of $f(x) = x^2$, but moved three units to the left, seven units upward, and reflected in the x -axis.

$$f(x) \text{ moved three units to the left } \Rightarrow g(x) = f(x + 3) = (x + 3)^2$$

$$g(x) \text{ moved seven units upward } \Rightarrow h(x) = g(x) + 7 = (x + 3)^2 + 7$$

$$h(x) \text{ reflected in the } x\text{-axis } \Rightarrow k(x) = -h(x) = -[(x + 3)^2 + 7] = -(x + 3)^2 - 7$$

So the function is $k(x) = -(x + 3)^2 - 7$



44. Write an equation for the function that has the same shape of $f(x) = |x|$, but moved one units to the left and seven units downward.

$$f(x) \text{ moved one units to the left } \Rightarrow g(x) = f(x + 1) = |x + 1|$$

$$g(x) \text{ moved seven units downward } \Rightarrow h(x) = g(x) - 7 = |x + 1| - 7$$

So the function is $h(x) = |x + 1| - 7$

