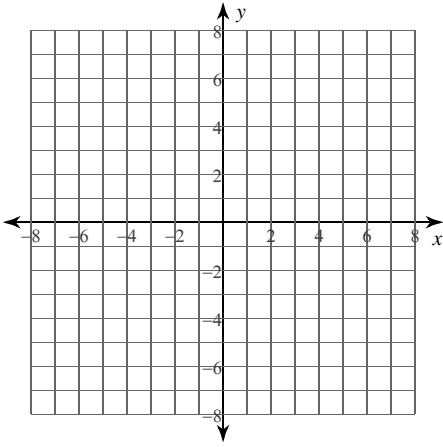


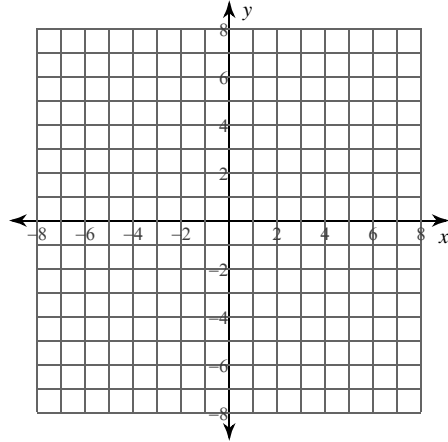
## Piecewise Functions

Sketch the graph of each function.

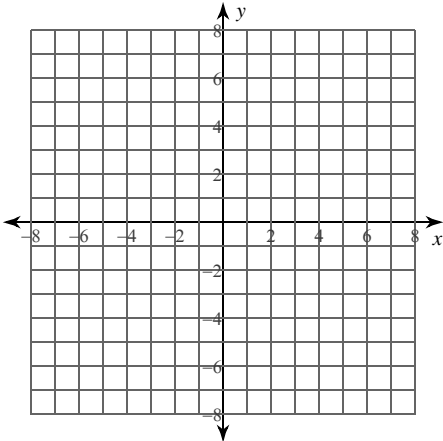
$$1) f(x) = \begin{cases} -2x - 1, & x \leq 2 \\ -x + 4, & x > 2 \end{cases}$$



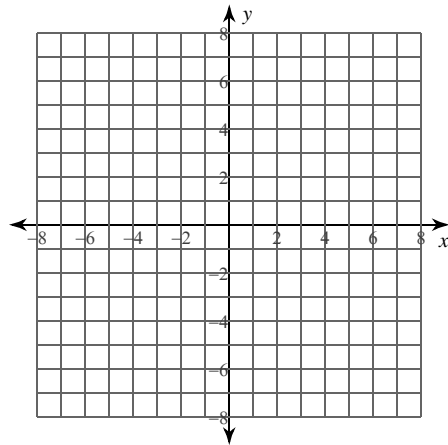
$$2) f(x) = \begin{cases} -4, & x \leq -2 \\ x - 2, & -2 < x < 2 \\ -2x + 4, & x \geq 2 \end{cases}$$



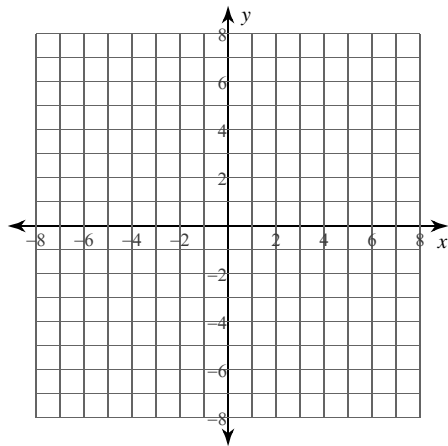
$$3) f(x) = \begin{cases} -2^x, & x < -4 \\ -|x|, & -4 \leq x \leq 0 \\ 4 - x^2, & x > 0 \end{cases}$$



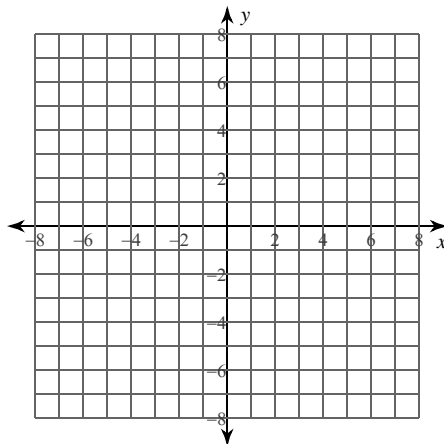
$$4) g(x) = \begin{cases} -6, & x < -2 \\ (x + 1)^4, & x \geq -2 \end{cases}$$



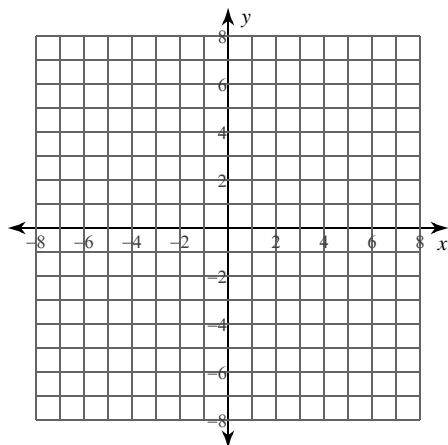
$$5) f(x) = \begin{cases} \frac{1}{x-4}, & x \leq 4 \\ -4, & x > 4 \end{cases}$$



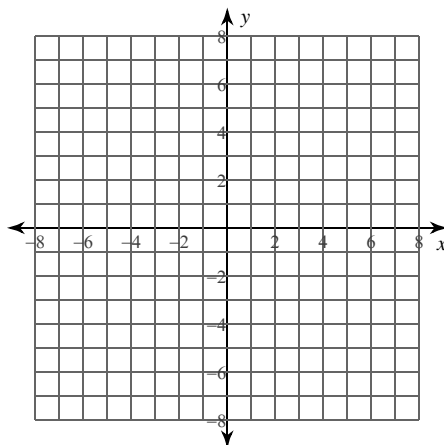
$$6) h(x) = \begin{cases} 2^x, & x < -3 \\ \frac{3}{x}, & x \geq -3 \end{cases}$$



$$7) w(x) = \begin{cases} \frac{|x|}{2}, & x \leq -4 \\ \sqrt{-x}, & -4 < x < 2 \\ |x-2|, & x \geq 2 \end{cases}$$



$$8) w(x) = \begin{cases} |x-3|, & x < 1 \\ (x-1)^4, & x = 1 \\ \sqrt{4x}, & x > 1 \end{cases}$$



**Critical thinking questions:**

- 9) Write a rule for the sign function  $s(n)$ :  
 $s(n)$  is  $-1$  when  $n$  is negative,  $+1$  when  $n$  is positive, and  $0$  otherwise.

- 10) Write a rule for the function shown.

