TRANSLATIONS	For $c > 0$ , the	For $c > 0$ , the following translations shift the original graph $y = f(x)$ as indicated.		
Translation	<u>Shift</u>	Example	Graph	
y = f(x) + c		$y = x^2 + 2$		
y = f(x) - c		$y = x^2 - 3$		
y = f(x - c)		$y = (x - 4)^2$		
y = f(x + c)		$y = (x + 1)^2$		

Ex: Sketch  $y = \sqrt{x+2} + 3$ 

## Reflections

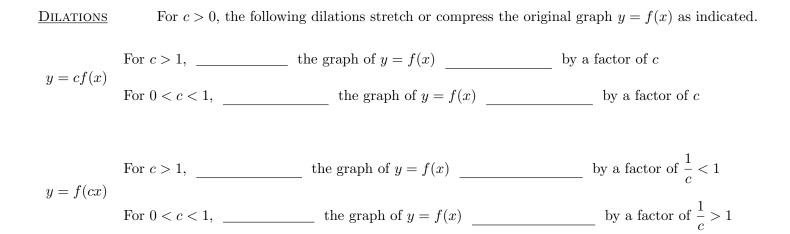
y = f(-x)

$$y = -f(x)$$

y = |f(x)|

Ex: Sketch  $y = |x^3 + 1|$ 

Ex: Sketch  $y = \frac{-1}{x-1}$ 



Ex: Given the following graph of y = f(x),

Sketch

(a). y = 2f(x) (c). y = f(4x)

(b). 
$$y = \frac{1}{3}f(x)$$
 (d).  $y = f\left(\frac{1}{2}x\right)$