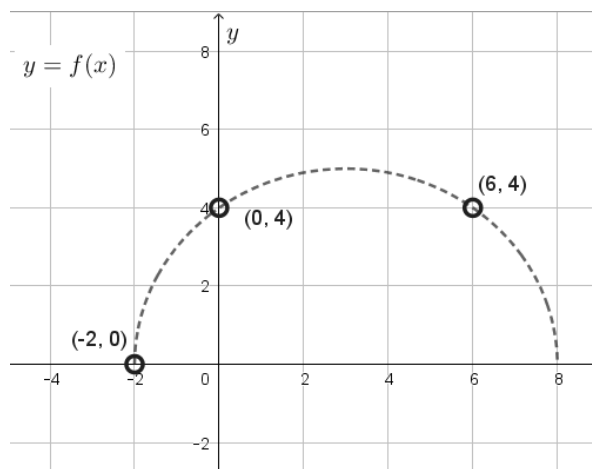


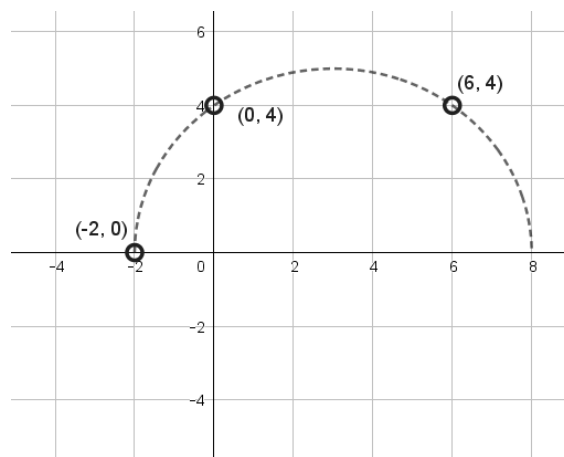
Vertical Transformations:  $y = f(x) + d$ ;  $y = af(x)$ ; and  $y = af(x) + d$

Sketch the related function:

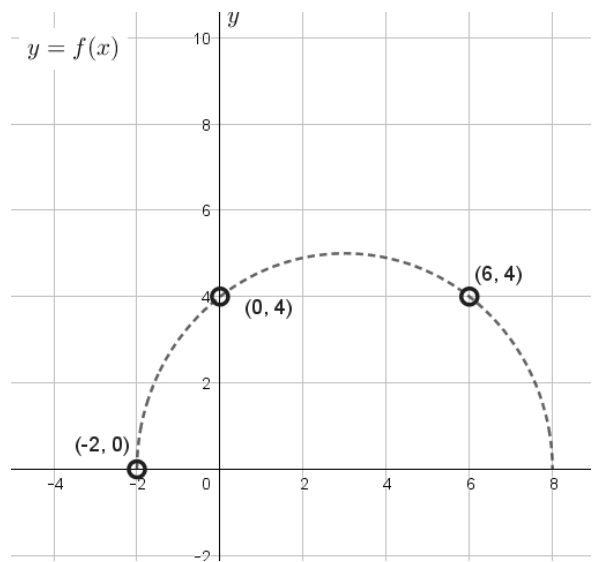
$$y = f(x) + 3$$



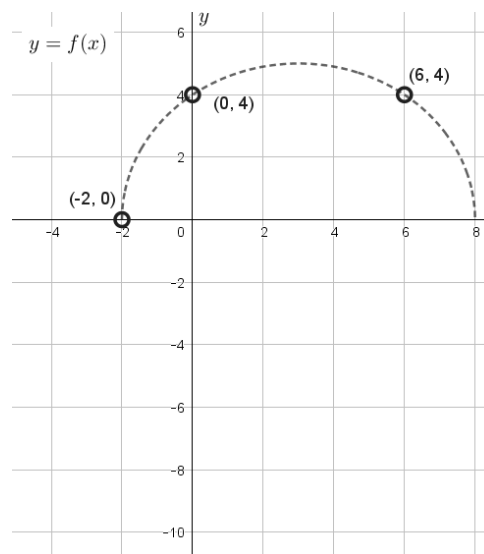
$$y = f(x) - 4$$



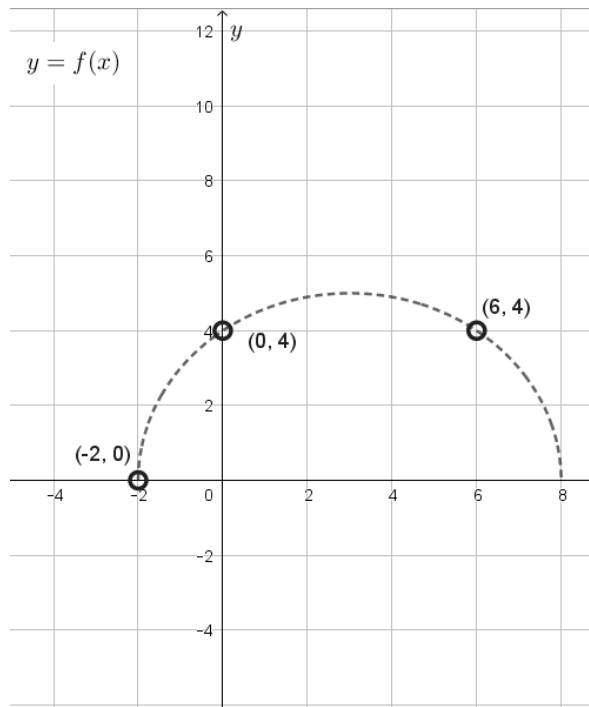
$$y = 2f(x)$$



$$y = -2f(x)$$

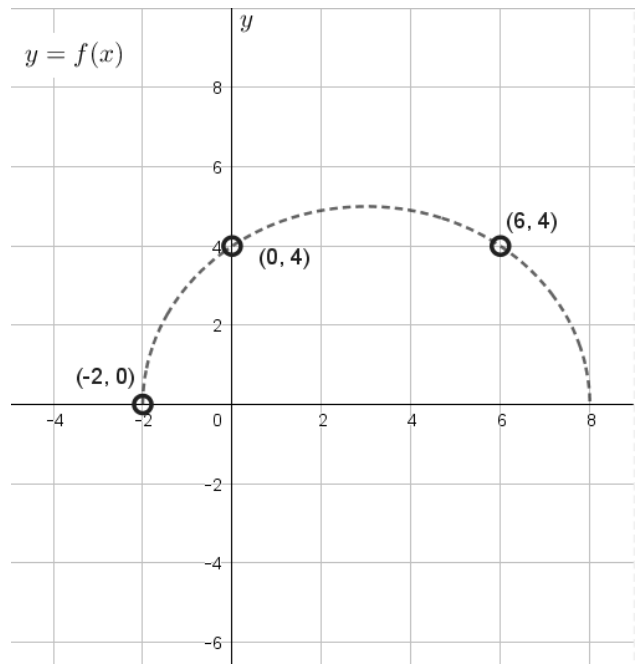


$$y = 2f(x) - 5$$

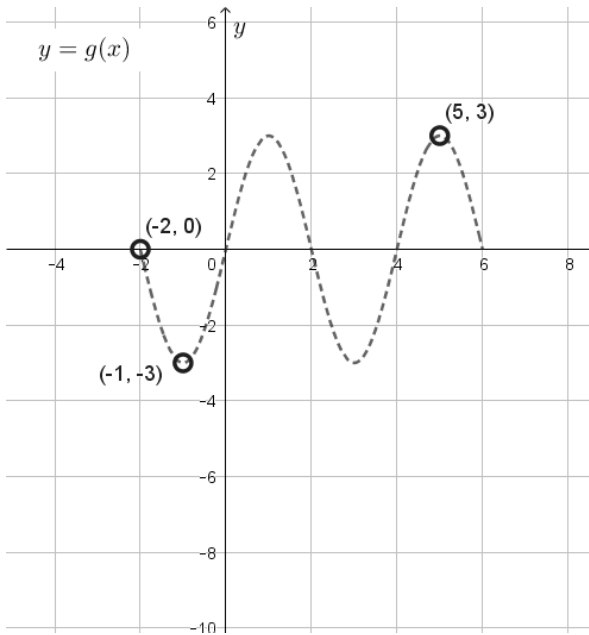


$$y = -f(x) + 5$$

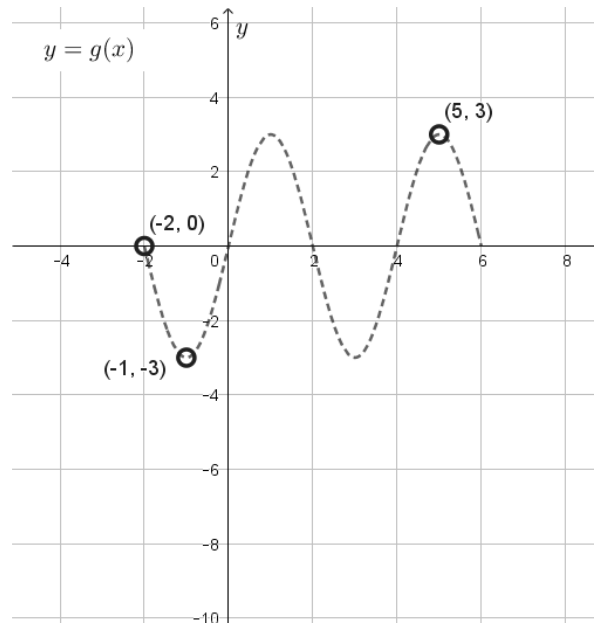
(note this is sometimes written  $y = 5 - f(x)$ ).



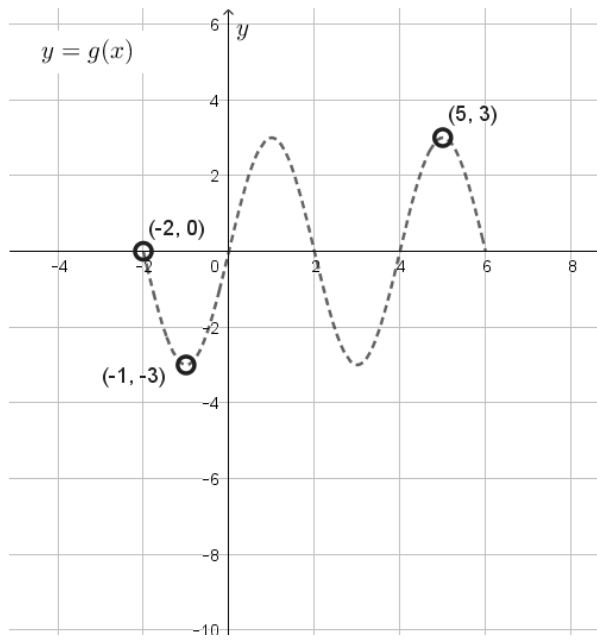
$$y = g(x) + 3$$



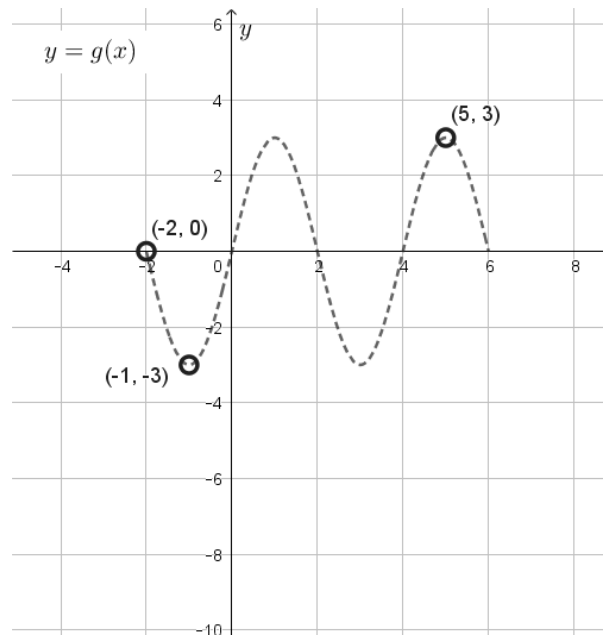
$$y = g(x) - 6$$



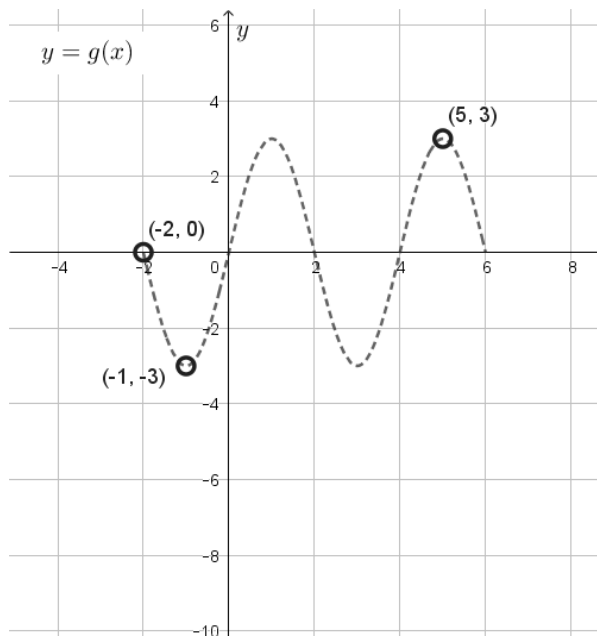
$$y = 2g(x)$$



$$y = -g(x)$$

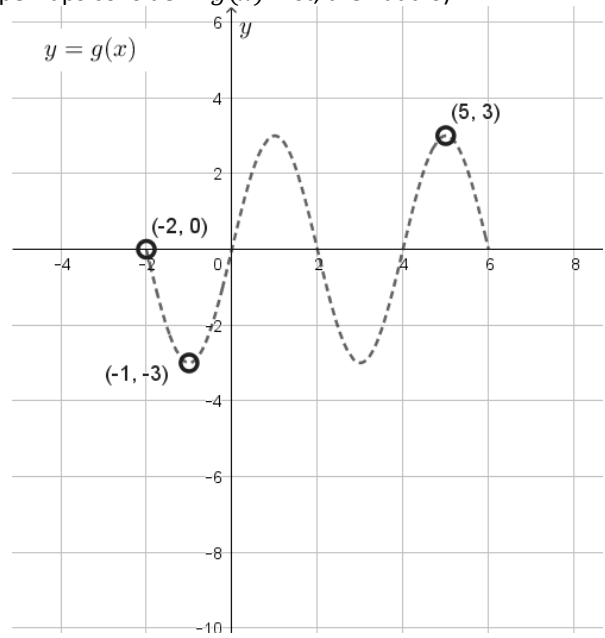


$$y = 3g(x) - 8$$

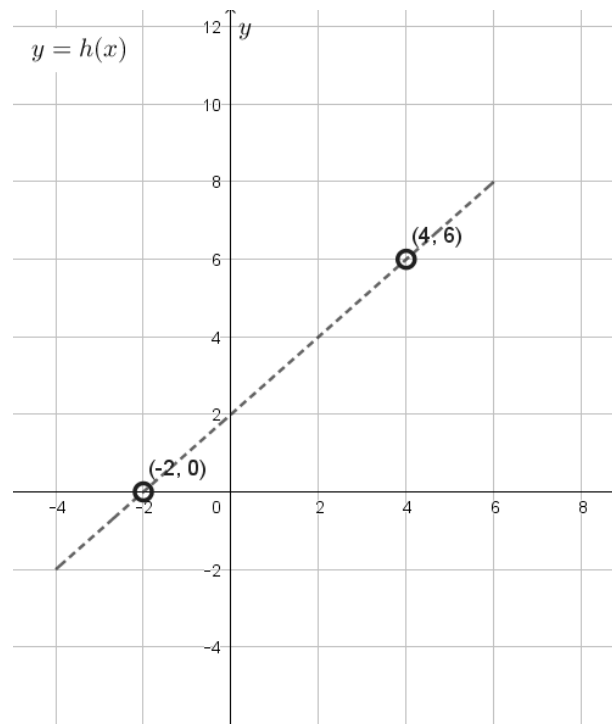


$$y = 6 - g(x)$$

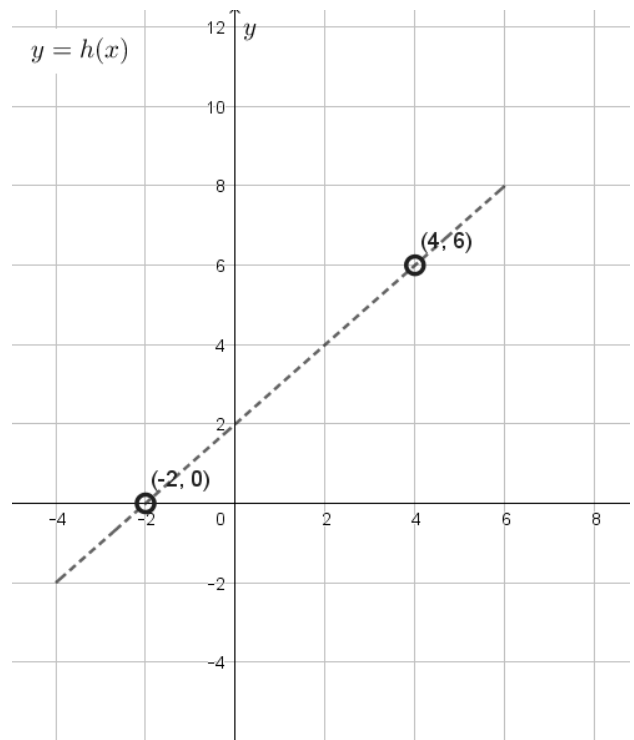
(perhaps consider  $-g(x)$  first, then add 6)



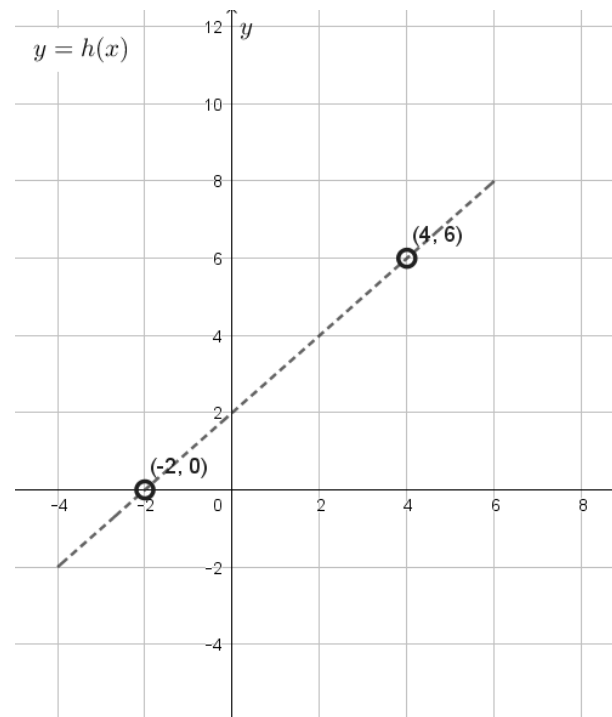
$$y = h(x) + 6$$



$$y = 2h(x)$$



$$y = 2h(x) - 4$$



$$y = -h(x) + 10$$

