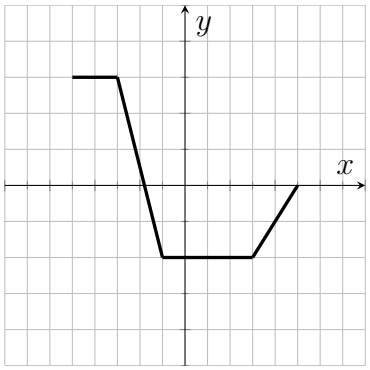
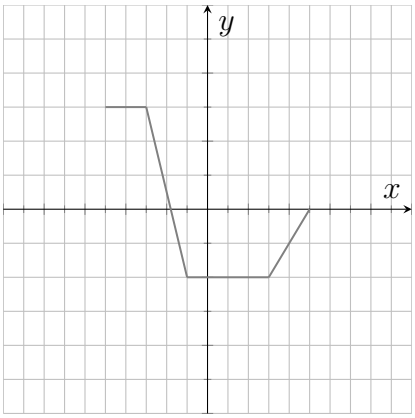
Name _____

Homework 11
Section 3.4

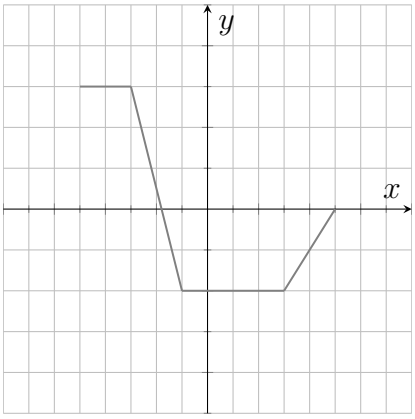
1. (2ea) Use the graph of $y = f(x)$ given below to sketch the graphs of each of the following.



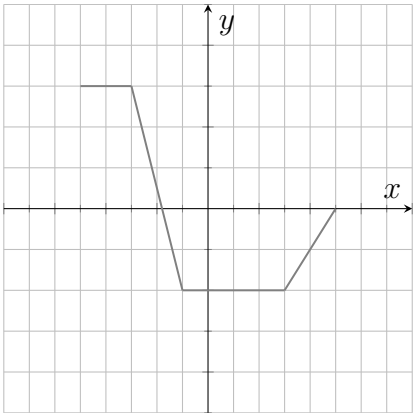
a) $y = 2f(x)$



b) $y = f(2x) - 1$



c) $y = \frac{1}{2}f(x) + 2$



2. (3) The graph of the function $g(x)$ is created by taking the graph of $f(x)$ and performing the following transformations, in the following order:

   - shifting it 3 units left
   - reflecting it across the x-axis
   - vertically expanding it by a factor of 5
   - shifting it down 8 units

   Write $g(x)$ in terms of $f(x)$.

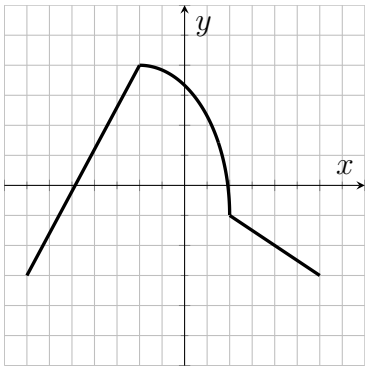
3. (2ea) Suppose $f(12) = -4$. Determine a point which must lie on the graph of the following:

   (a) $y = -3f(x+8) - 5$

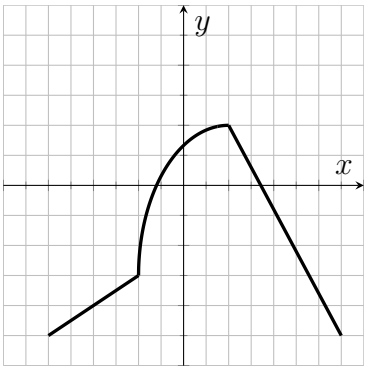
   (b) $y = \frac{1}{2}f\left(\frac{4}{3}x\right)$

4. (3) Write an equation which transforms $y = x^3$ by shifting it right 4 units and reflecting it across the x-axis.

5. (4) The graph on the left is the graph of the function $f(x)$. The graph has then been transformed via vertical shifts, horizontal shifts, and/or reflections to obtain the graph of $g(x)$ shown on the right. Determine the function $g(x)$ in terms of $f(x)$ (i.e. insert the appropriate transformations).



The graph of $y = f(x)$



The graph of $y = g(x)$