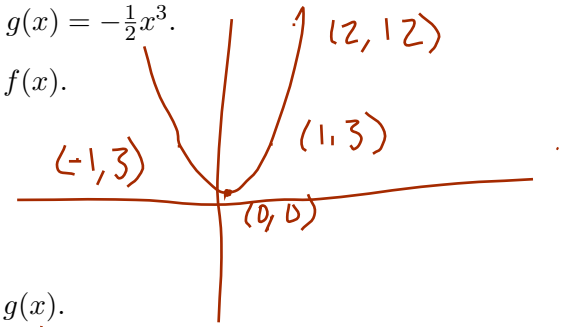
Name:

HW 5: §1.6-1.8

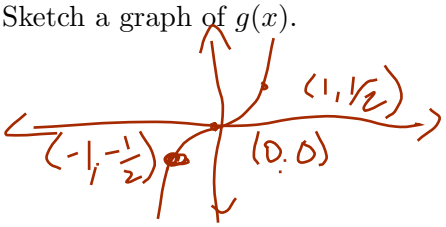
Complete the following problems to the best of your ability. **SHOW ALL OF YOUR WORK.** Unshown work will not be graded. You may use a calculator.

1. Let $f(x) = 3x^2$ and let $g(x) = -\frac{1}{2}x^3$.

   (a) Sketch a graph of $f(x)$.



   (b) Sketch a graph of $g(x)$.



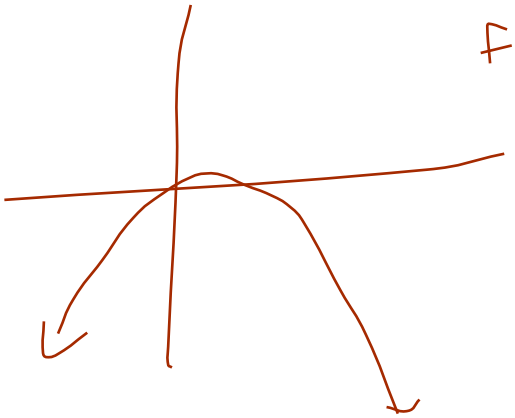
   (c) Using a graphing calculator or a computer, find the intersection of f and g. At what x-value are these two functions the same?

$x = 0, 6$

2. Use a graphing calculator or a website with graphing capabilities (e.g. Wolfram Alpha) to graph the function $f(x) = -2x^2 + 4x - 1$. Use the graph to answer the following.

   (a) Estimate $f(4)$ from the graph.

$f(4) \approx -25$



(b) What are the domain and range of f?

dom: $(-\infty, \infty)$

range: $(-\infty, 1]$

(c) On what interval(s) is f increasing? Decreasing?

increase $(-\infty, 1)$

decrease $(1, \infty)$

(d) Give coordinates of any local extrema of f.

$(1, 1)$

3. Suppose a business that prints t-shirts pays \$450 for rent on their building and equipment for a day, and that each t-shirt costs the business \$2.20 to print.

   (a) Find a function $C(x)$ that gives the cost C in dollars of printing x shirts.

$C(x) = 450 + 2.2x$

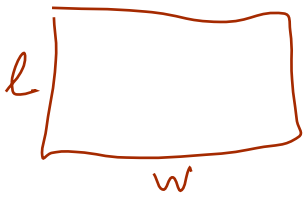
(b) **Find and Interpret** $C(85)$.

$C(85) = 2.2(85) + 450 = 637$

Making 85 shirts costs $637

4. Farmer O'Fencerty wants to build a rectangular fence using 900 meters of fencing.

   (a) Find a function $A(w)$ that gives the area A of the paddock as a function of w, the width of the paddock.



$A = wl$ and $2w + 2l = 900$

so $l = 450 - w$

and so

$A(w) = w(450 - w) = 450w - w^2$

   (b) Find and interpret $A(350)$.

$A(350) = 145,250$

if the width is 350m, the area is

$145,250\ m^2$

Optional Problems:

1.6: All
1.7: All
1.8: All