1. (15 pts) DIFFERENTIATE, don’t antidifferentiate, $xy^2 + \sin(x^2)$ with respect to $x$.

2. (15 pts) First find the general solution to the differential equation

$$\frac{dy}{dt} = y^4$$

then find the particular solution such that $y = 1$ when $t = 0$.

3. (15 pts) On the surface of the moon, the acceleration of gravity is $-5.28$ feet per second per second. If an object is thrown upward from an initial height of 1200 feet with a velocity of 62 feet per second then find it’s velocity and height 3 seconds later.

4. You need not show work on this problem.

1. (5 pts) The graph of $f(x)$ is drawn on the board. Redraw the graph and label all relative minimum values or state that none exist.

2. (5 pts) Write $1 + 2 + 4 + 8 + 16$ in $\sum$ notation in TWO DIFFERENT ways. (There are many ways. Write two of them.)

3. (5 pts) The graph of a function $g(x)$ is sketched on the board. Sketch a graph of $\int g(x) \, dx$