Antiderivatives

1. Find the most general antiderivative for each of the following:

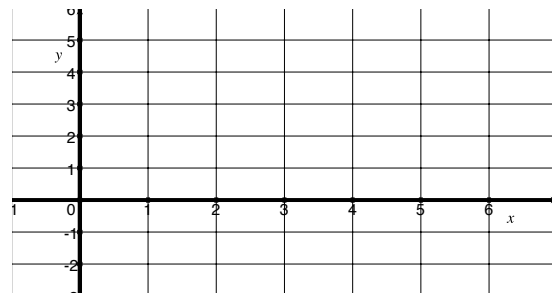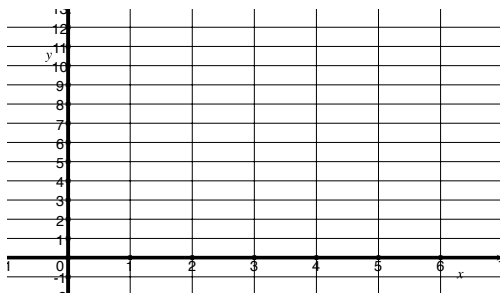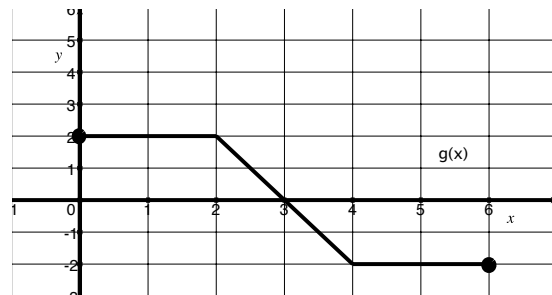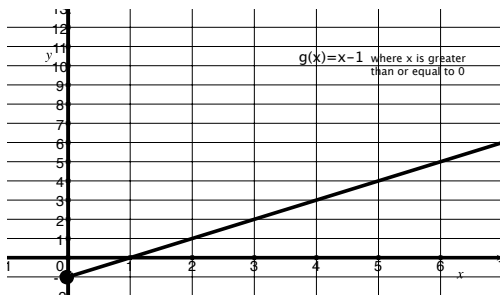 $2x + 1$ $\qquad\qquad\qquad$ $x^2 - e^x$ $\qquad\qquad\qquad$ $\sin(x)$

   $\dfrac{-1}{x^2}$ $\qquad\qquad\qquad$ $\dfrac{1}{x}$ $\qquad\qquad\qquad$ $\dfrac{2x^5 - \sqrt{x}}{x}$

2. Repeat the exercise we did at the start of class. That is, for each graph of g below, sketch a graph of $G(x) = \displaystyle\int_0^x g(t)\,dt$.

g(x)=x−1 where x is greater than or equal to 0

g(x)

Fundamental Theorems of Calculus

1. For each function F defined below, find F'.

$$F(x) = \int_5^x t^2 - e^t \, dt \qquad\qquad F(y) = \int_1^{1+3y} \frac{u^3}{1+u^2} \, du$$

$$F(y) = \int_1^{e^y} \ln(t) \, dt \qquad\qquad F(x) = \int_x^\pi \sqrt{1+\sec(t)} \, dt$$

2. Evaluate:

$$\int_0^1 x^2 \, dx \qquad\qquad \int_2^6 \frac{1}{u} \, du \qquad\qquad \int_{-1}^3 \frac{1}{x^2} \, dx$$

Verify your answers by considering the graphs and/or looking at examples 6, 7, & 9 on pages 392-393.