College of the Holy Cross, Spring Semester, 2019
Math 134 Worksheet 3
Due Tuesday, February 5

1. Evaluate the following indefinite integrals.

   (a) $\displaystyle\int 2x^6 - 3x + 5x^{3/2}\,dx$

   (b) $\displaystyle\int (x-2)(2x+3)\,dx$

   (c) $\displaystyle\int \frac{x^3+3x^2+1}{x^3}\,dx$

   (d) $\displaystyle\int 6\sec^2(x)\,dx$

   (e) $\displaystyle\int 8\sin(3x)\,dx$

   (f) $\displaystyle\int 2e^{-4x}\,dx$

   (g) $\displaystyle\int \frac{5}{x^2+1}\,dx$

   (h) $\displaystyle\int \frac{9}{\sqrt{1-x^2}}\,dx$

2. Find the function y that satisfies $\dfrac{dy}{dx} = 6\sqrt{x} + 7$ and $y(1) = 6$.

3. A train is moving at 40 meters per second when the engineer sees a deer stuck on the tracks 220 meters ahead. The engineer immediately puts on the brakes, causing the train to decelerate at constant rate and come to rest after 10 seconds.

   (a) What is the acceleration of the train while the brakes are being applied?

   (b) Find the velocity $v(t)$ of the train at time t seconds after the engineer puts on the brakes.

   (c) Find the position $s(t)$ of the train at time t.

   (d) How far does the train go before it stops? Will the deer get hit?