Math 141 - Homework 14 **Name:** _____

Evaluate the following definite integrals.

1. $\int_{-1}^{2} (2x - x^2)\, dx$

2. $\int_{0}^{\pi} 2\cos x - 1\, dx$

3. $\int_{0}^{2} (t-1)(t+2)\, dt$

4. $\int_{0}^{\pi/4} \sec\theta \tan\theta + \sec^2\theta\, d\theta$

5. Find the area under the curve $y = \dfrac{1}{x^2}$ from $x = 1$ to $x = 10$.

6. Suppose that the voltage of a battery is decreasing at a rate of $\dfrac{-5}{(t+1)^2}$ volts per year. How much will the voltage of the battery decrease in 3 years?

Use u-substitution to find the following integrals.

7. $\int (x-3)^6\,dx$

8. $\int \frac{2x}{\sqrt{x^2+1}}\,dt$

9. $\int \frac{1}{(4x+1)^{1/3}}\,dt$

10. $\int_0^{\pi/6} 3\cos 2x\,dx$

11. Find the average value of the function $f(x) = 2\sin x$ on the interval from 0 to π.