1. Find the indicated areas

   (a) $\int_{.7613}^{7.7051} 3\ln(2x) - (x + 0.5)\ dx = 8.5630$

   (b) $\int_{0}^{1.9855} 5\cos(x) - (x - 4)\ dx + \int_{1.9855}^{3} (x - 4) - 5\cos(x)\ dx = 12.8885$

2. (a) $\int_{0}^{2} r(t)\ dt = 1.0986$ thousand antibodies

   (b) $\int_{2}^{7} r(t)\ dt = 2.1401$ thousand antibodies

3. (a) $\int_{0}^{T} v(x)\ dx$

   (b) distance fallen $= \int_{0}^{20} v(x)\ dx = 739.5291$meters

   height = 5000 - 739.5291 = 4260.4709 meters

   (c) engine hits the ground when $\int_{0}^{T} v(x)\ dx = 5000$. solve for T.

   Answer: 107.0399 seconds or 107.040 seconds

4. (a) $\int_{0}^{12} f'(x)\ dx = f(12) - f(0)$

   $120 = 100 - f(0)$

   $f(0) = -20$

   (b) $\int_{12}^{32} f'(x)\ dx = f(32) - f(12)$

   $-80 = f(32) - 100$

   $f(32) = 20$

5. (a) $\int (6x^2 + 8x - 10)dx = 2x^3 + 4x^2 - 10x + c$

   (b) $\int (e^{3x} + \frac{5}{x})dx = \frac{1}{3}e^{3x} + 5\ln(x) + c$

6. (a) $\int (x^2 + 5)(x^2 + 4)dx = \int x^4 + 9x^2 + 20dx = \frac{x^5}{5} + 3x^3 + 20x + c$

   (b) $\int 8\cos(2x) + 20\sin(5x)dx = 4\sin(2x) - 4\cos(5x) + c$