MAT 161-004 and MAT 161-300
Answers to practice problems for the Final Exam

1. $y = 11x - 16$

2. a) $-\frac{1}{6}$ b) $-2$

3. a) $-6sin^2(-2x)\cos(-2x)$ b) $\frac{3}{x^2 ln2}(1 - lnx)$

4. $y' = \frac{3x^2+2y}{3y^2-2x-e^y}$

5. $L(x) = \frac{1}{4}x + \frac{3}{4}$

6. 1.3734671196961651667

7. $y' = (\sec(x))^x(xtanx + \ln(\sec(x)))$

8. $432\pi\ in^3/sec$

9. Absolute minimum value $\frac{\sqrt{e}}{2}$ or .8243606354
   Two inflection points at (±.3215458712 , .9189102665)

10. a) $-\frac{1}{2}\sin(3 - x^2) + C$ b) 5

11. a) The object is slowing down because acceleration is acting as a force in the opposite direction from the velocity. (v(1) and a(1) have opposite signs.)
    b) 15.4

12. a) $2\sqrt{3} - \frac{2\pi}{3}$ b) $\pi\sqrt{3} + \frac{2}{3}\pi^2$

13. Absolute maximum value is $\frac{4\sqrt{6}}{9}$ Absolute minimum value is $-4$

14. 375 ft-lb

15. $333\frac{1}{3}\ ft^2$

16. 312