Lesson 2.3 P1/2

1. $f'(x) = 4x^3 - 6x^2 + 2x - 2$

3. $\frac{1}{3}t^{4/3} + \frac{4}{3t^{2/3}} = y'$

5. $f'(x) = 3x^2\cos x - x^3\sin x$

7. $f'(x) = \frac{-x^2+1}{(x^2+1)^2}$

10. $h' = \frac{\frac{1}{2}\sqrt{s} - 1}{(\sqrt{s}-1)^2}$

11. $g' = \frac{x\cos x - 2\sin x}{x^3}$

8. $g' = \frac{2t^2 - 14t - 4}{(2t-7)^2}$

13. $f' = 10x^4 + 12x^3 - 2x^2 - 18x - 15$
$f'(0) = -15$

15. $f' = \frac{x^2 - 6x + 4}{(x-3)^2}$; $f'(1) = -\frac{1}{4}$

17. $f' = \cos x - x\sin x$
$f'(\frac{\pi}{4}) = \frac{4\sqrt{2} - \pi\sqrt{2}}{8}$

19. $y' = \frac{2}{3}x + \frac{2}{3}$

21. $y' = \frac{-7}{x^4}$

25. $f' = \frac{2}{(x+1)^2}$

33. $f' = \frac{-2x^2 + 2x - 3}{(x^2 - 3x)^2}$

34. $g'(x) = \frac{x^2+2x+2}{(x+1)^2}$

39. $f'(t) = 2t\sin t + t^2\cos t$

43. $f'(x) = \tan^2 x$
(hint trig identity)

45. $g'(x) = \frac{1}{4t^{3/4}} + 8\sec t\tan t$

49. $y' = \cos x(\cot^2 x)$

53. $2\sin x + 4x\cos x - x^2\sin x$

64. $y = -2x + 2$

67. $y = 2x + (1 - \frac{\pi}{2})$

88. $\frac{d}{dx}\sec x = \sec x\tan x$

(a) LHS:

$\frac{d}{dx}\frac{1}{\cos x} =$

$\frac{0\cos x - (-\sin x)}{\cos^2 x} =$

$\frac{\sin x}{\cos^2 x} =$

$\frac{\sin x}{\cos x} \cdot \frac{1}{\cos x} =$

$\tan x\sec x = RHS$ QED

(b) $\frac{d}{dx}\csc x = -\csc x\cot x$

$\frac{d}{dx}\frac{1}{\sin x} =$

$\frac{-\cos x}{\sin^2 x} =$

$-1\left(\frac{\cos x}{\sin x}\right)\cdot\frac{1}{\sin x} =$

$-\csc x\cdot\cot x = RHS$, QED

95. $f' = \frac{-1}{x^2-2x+1}$

$f'' = \frac{2}{(x-1)^3}$

96. $f' = \frac{x^2+1}{x^2}$

$f'' = \frac{-2}{x^3}$

97. $f' = 3\cos x$

$f'' = -3\sin x$

116.

a) 2.4 ft/sec^2

b) 1.2 ft/sec^2

c) .5 ft/sec^2