AB-A Final Exam review

1a. -4 b. 5 c. DNE d. 5 e. 4 f. 4

g. 4 h. DNE i. No; LH lim ≠ RH lim. j. No f(3) DNE (hole)

2. 8/3

3a. 3 b. 0 c. DNE d. -5 e. 1/6

4a. -3/8 b. 0 c. -∞ d. $\pm 3/2$ e. 3/2

5a. $VA\ x = 1, x = -1$ b. $VA\ x = -4\ \ hole\ at\ x = 1$

6a. 140 m b. 28 m/sec. c. avg. rate of change=slope of secant line

d. 78 m/sec. Instantaneous rate of change=slope of tangent line

7. 48

8. 0

9. x=-4 VA; x=-2 pt. disc.; x=3 corner

10a. $f'(x) = 6x^5 - 12x^3 + 21x^2 - 21$ b. $f'(x) = \frac{12x^2+31z-4}{2(x+2)^{1/2}}$

11a. $f'(x) = \frac{-1}{x^2} - \frac{15}{x^4} - 3x^2 + 3$ $f"(x) = \frac{2}{x^3} + \frac{60}{x^5} - 6x$

11b. $f'(x) = x^4 + \frac{15}{2\sqrt{x}}$ $f"(x) = 4x^3 - \frac{15}{4x^{3/2}}$

12a. $f'(x) = \frac{3x^2-4}{2\sqrt{x^3-4x+7}}$ b. $g'(x) = 4(13x^2 - 5x)^3(26x - 5)$

13a. $y' = -12x^3csc^3(x^4)\cot(x^4)$ b. $y' = 2x^3sec^2(2x) + 3x^2\tan(2x) - 3xcsc^2x + 3cotx$

14a. $y' = e^{secx}(secxtanx)$ b. $y' = \ln\left(\frac{1}{16}\right)\sin(2x)\,4^{\cos(2x)}$

c. $y' = \frac{1-4\ln(2x)}{x^5}$ d. $y' = 2$

15. $y' = \frac{-3x}{|x|\sqrt{16x^2-1}} + 3\csc^{-1}(4x)$ b. $y' = \frac{-3}{(\sin^{-1}x)^2\sqrt{1-x^2}}$

16. $\frac{dy}{dx} = \frac{ycos(xy)}{3y^2+8y-xcos(xy)}$ b. $\frac{dy}{dx} = \frac{5y-4x^3}{4y^3-5x}$

17. $y - 7 = 8(x - 2)$

18 $y - 7 = -\frac{1}{8}(x - 2)$

19. f(x) increasing $(-1,0), (1, \infty)$ f(x) decreasing $(-\infty, -1), (0,1)$

20. $max \quad -63.51 \; at \; x = \sqrt{\frac{1}{3}} \qquad -220 \; at \; x = -2$

21a. -8 ft. b. -4 ft/sec. c. $v(t) = 3t^2 - 8t$ d. . $a(t) = 6t - 8$

e. $stopped \; at \; t = 0 \;\; and \; t = \; 8/3 \quad forward \;\; (8/3, \; \infty); \quad backward \; (0, \; 8/3)$

f. $slowing \; down \;\; (4/3, 8/3) \quad speeding \; up \;\; (0, 4/3) \; and \; (8/3, \infty)$

22. x = 1.167 dimensions 2.334 x 3

23. $\frac{dh}{dt} = \; .309 \frac{m}{min}$