

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 $\neq$ 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. $-\infty$ 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. $y' = -12x^3 \csc^3(x^4) \cot(x^4)$ b. $y' = 2x^3 \sec^2(2x) + 3x^2 \tan(2x) - 3x \csc^2 x + 3 \cot x$

14a. $y' = e^{\sec x} (\sec x \tan x)$ 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. $\frac{dy}{dx} = \frac{y \cos(xy)}{3y^2+8y-x \cos(xy)}$ 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. $\max -63.51$ at $x = \sqrt{\frac{1}{3}}$ -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 $t = 8/3$ *forward* $(8/3, \infty)$; *backward* $(0, 8/3)$

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

22. $x = 1.167$ dimensions 2.334×3

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