Midterm 1 Review Key  
(from class notes)

Ex 1:  (a) 0  (b)  \(-\frac{3}{7}\)  (c)  \(-\infty\)

Ex 2:  (a) 2  (b)  \(\frac{19}{8}\)

Ex 3:  (a) DNE (because the right and left hand limits are not the same)  
(b)  \(\infty\)

Ex 4:  VA at x=5; holes at x=0, -2; only the holes are patchable

Ex 5:  (a)  \(f'(x)=\frac{-1}{(2x-1)^{3/2}}\)  (b)  \(f'(x)=3x^2\)

Ex 6:  (a)  \(y' = \sec^2 x - \sin x\)  (b)  \(y' = (-15x^{-6} + 2\pi x)(x^{-6} + 9) + (3x^{-3} + \pi x^2 - 7)(-6x^{-7})\)
(c)  \(y' = \frac{(x+1)(x^2+1)(8x+3)-(4x^2+3x-8)[1(x^2+1)+(x+1)(2x)]}{(x+1)^2(x^2+1)^2}\)

Ex 7:  \(y = -\frac{3}{2} x + \frac{1}{2}\)

Ex 8:  \(\lim_{x \to 1^-} f(x) = 4\) ,  \(\lim_{x \to 1^+} f(x)\) DNE ,  \(\lim_{x \to 3^-} f(x) = 0\) ,  \(f(3)\) DNE ,  \(f(0)\) DNE
This function is continuous on the interval  \([-4, 0) \cup [1, 3) \cup (3, \infty)\).  
At x = 3, there is a hole.