

Quiz 3 - Sections 2.3, 2.4

Name: ~~XXXXXXXXXX~~

Solution

1. Find values for a and b so that f(x) is continuous:

$$f(x) = \begin{cases} ax+3 & \text{if } x > 5 \\ 8 & \text{if } x = 5 \\ x^2+bx+1 & \text{if } x < 5 \end{cases}$$

$$\lim_{x \rightarrow 5^-} f(x) = f(5)$$

$$\lim_{x \rightarrow 5^-} x^2+bx+1 = 8$$

$$(5)^2 + b(5) + 1 = 8$$

$$5b = -16$$

$$b = \frac{-16}{5}$$

$$\lim_{x \rightarrow 5^+} f(x) = f(5)$$

$$\lim_{x \rightarrow 5^+} ax+3 = 8$$

$$a(5) + 3 = 8$$

$$5a = 5$$

$$a = 1$$

2. Evaluate $\ln(\log 10^e)$

$$\ln(\log 10^e) = \ln e = 1$$