

Assignment #4

Name _____

Due Wednesday, 20 September 2017

Use proper notation. Use equal signs.

1. Let

$$f(x) = \begin{cases} x^2 + 2x + 2 & \text{if } x > -1 \\ \frac{x^2 - 2x - 3}{x^2 - 1} & \text{if } x < -1 \\ 2 & \text{if } x = -1. \end{cases}$$

(a) Is f continuous at $x = -1$? Give a complete explanation, appealing to the definition of continuity.

(b) If f is not continuous at $x = -1$, is it right or left continuous at $x = -1$? Give a complete explanation, appealing to the definitions of left and right continuity.

2. Use the **definition** of the derivative to find the equation of the tangent line to the curve $y = f(x) = \frac{x}{x+4}$ at the point $(-2, -1)$.