Solutions to Homework Assignment 4

MA TH 141-01

Section 2.1, Page 65, Stewart: Calculus 6e

1, 3, 5 odd

1. (a) \( PQ_5 = \frac{250 - 694}{15 - 5} = -44.4, \ PQ_{10} = \frac{250 - 444}{15 - 10} = -38.8, \ PQ_{20} = \frac{250 - 111}{15 - 20} = -27.8, \ PQ_{25} = \frac{250 - 28}{15 - 25} = -22.2, \ PQ_{30} = \frac{250 - 0}{15 - 30} = -16.6. \)

(b) I will average the two adjacent points: \( m_{TL} \approx \frac{-38.8 + (-27.8)}{2} = -33.3. \)

(c) From the graph below, it appears that the slope of tangent line is about -33.3, as expected.

3. (a) I will just do the last one: \( \frac{1.001}{1 + 1.001 - 1} \quad \frac{1}{1 + 1} \approx 0.2498751000. \)

(b) It appears that the slope of the tangent line is about \( \frac{1}{4}. \)

(c) We get \( y - \frac{1}{2} = \frac{1}{4}(x - 1), \) or \( y = \frac{1}{4}x + \frac{1}{4}. \)

5. (a) I will just do the last one: \( \frac{[40(2.01) - 16(2.01)^2] - [40(2) - 16(2)^2]}{2.01 - 2} = -24.16. \)

(b) The instantaneous velocity is about -24 ft/s.