

ENGR 1990 Engineering Mathematics

Homework #2 Answers

1. (a) $t = \begin{cases} 0.132 \text{ (sec)} \\ 2.35 \text{ (sec)} \end{cases}$
 - (b) $y_{\max} = 84.8 \text{ (ft)}$
 - (c) $y(x) = 60 + \frac{4}{3}x - 0.0179x^2$
 - (d) $y(x) = 0.333x - 6.67$
 - (e) $(x, y) = (95.1, 25.0) \text{ (ft)}$

2. (a) $M(0) = 5000 \text{ (ft-lb)}$; $M(L) = M(10) = 0 \text{ (ft-lb)}$
 - (b) $x = 5.53 \text{ (ft)}$
 - (c) The moment equation is a quadratic equation. It is concave upward with its minimum value of zero at $x = L = 10 \text{ (ft)}$. Hence, the moment will increase as x decreases with the maximum value at $x = 0 \text{ (ft)}$. So, $M_{\max} = M(0) = 5000 \text{ (ft-lb)}$.
 - (d) $M_{\max} = 6780 \text{ (N-m)}$

3. $I = \begin{cases} +2 \text{ (amps)} \\ -4 \text{ (amps)} \end{cases}$

4. $R_1 = 9.15 \text{ (ohms)}$; $R_2 = 4.15 \text{ (ohms)}$; $R_3 = 17.15 \text{ (ohms)}$