

## Elementary Engineering Mathematics

### Exercises #2 Answers

1. (a)  $t \approx \begin{cases} 0.132 \text{ (sec)} \\ 2.35 \text{ (sec)} \end{cases}$

(b)  $y_{\max} \approx 84.8 \text{ (ft)}$

(c)  $y(x) \approx 60 + \frac{4}{3}x - 0.0179x^2$

(d)  $y(x) \approx 0.333x - 6.67$

(e)  $(x, y) \approx (95.1, 25.0) \text{ (ft)}$

2. (a)  $M(0) = 5000 \text{ (ft-lb)}$ ;  $M(L) = M(10) = 0 \text{ (ft-lb)}$

(b)  $x \approx 5.53 \text{ (ft)}$

(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)  $M_{\max} \approx 6780 \text{ (N-m)}$

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

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