

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