Elementary Engineering Mathematics
Exercises #1 – Application of Lines

1. $k_{\text{avg}} \approx 57.4$ (lb/in), $y_0 \approx 0.174$ (in)

2. a) $a_{\text{avg}} \approx -9.72$ (ft/s^2)
   b) $v(t) \approx 121 - 9.72t \quad \left(0 \le t \le t^*\right)$
   c) $v_0 \approx 82.4$ (mi/hr)
   d) $t^* \approx 12.4$ (sec)

3. a) acceleration phase: $v(t) \approx 15.9t \quad \left(0 \le t \le 5\right)$
      deceleration phase: $v(t) \approx 126 - 9.25t \quad \left(5 \le t \le t^*\right)$
   b) $t^* \approx 13.6$ (sec)
   c) $t^* = \left(5a_1 - 79.5\right)/a_1 \quad \left(a_1 \text{ in ft/s}^2\right)$
   d) $v_{\max} \approx 54.2$ (mi/hr)

4. a) $R_{\text{avg}} = 8.00$ (ohms)
   b) $V = 8.00I$ (V is in volts, and I is in amps)

5. a) $R \approx 8.57$ (ohms)
   b) $I \approx \left(\frac{1}{8.57}\right)V - 0.583$ (V is in volts, and I is in amps)