

20. (a) The rock will hit the ground when  $16t^2 = 576$ ,  $t^2 = 36$ ,  $t = 6$  s (only  $t \geq 0$  is meaningful)

(b) 
$$v_{\text{ave}} = \frac{16(6)^2 - 16(0)^2}{6 - 0} = 96 \text{ ft/s}$$

(c) 
$$v_{\text{ave}} = \frac{16(3)^2 - 16(0)^2}{3 - 0} = 48 \text{ ft/s}$$

21. (a)  $(40)^3 / \sqrt{10} = 20,238.6$  ft

(b)  $v_{\text{ave}} = 20,238.6 / 40 = 505.96$  ft/s

(c) Solve  $s = t^3 / \sqrt{10} = 135$ ,  $t \approx 7.53$ ,  $v_{\text{ave}} = 135 / 7.53 = 17.93$  ft/s.