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$$y = v_0 t + \frac{1}{2} a t^2, \quad y = 80t - \frac{1}{2} 32.2 t^2$$

for  $y = -200 \text{ ft}$ ,

$$-200 = 80t - 16.1 t^2$$

$$\text{or } 16.1 t^2 - 80t - 200 = 0$$

$$t = \frac{80 \pm \sqrt{(80)^2 + 4(16.1)(200)}}{2(16.1)} = \underline{6.80 \text{ sec (or } -1.83 \text{ s)}}$$

$$\text{For } v = 0, \quad v^2 = v_0^2 + 2ay, \quad y = h = \frac{0 - 80^2}{-2(32.2)} = \underline{99.4 \text{ ft}}$$