

c) Find avg velocity over  $[1, 3]$  sec.

$$\frac{h(3) - h(1)}{3 - 1} = \frac{46 - 134}{2} = -44 \text{ ft/sec}$$

d) Find instantaneous velocity at  $t=1$  and  $t=3$  sec

$$v(1) = -32(1) + 20 = -12 \text{ ft/sec}$$

$$v(3) = -32(3) + 20 = -76 \text{ ft/sec}$$

e) At what time does the ball hit the ground?

$$s(t) = 0 = -16t^2 + 20t + 130$$

$$t = 3.54 \text{ sec}$$