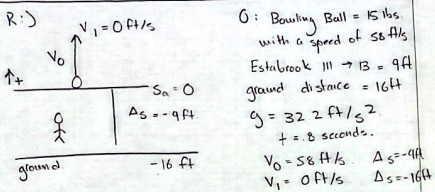


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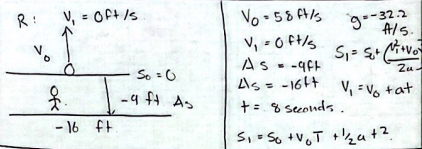
A) P: What is the velocity of the ball at .8 seconds?



C:  $s_1 = s_0 + v_0 T + \frac{1}{2} a T^2$ ,  $v_1 = v_0 + a T$   
 $s_1 = s_0 + \left( \frac{v_1^2 - v_0^2}{2a} \right)$   
Solution  $v_1 = v_0 + a \cdot T = 58 \text{ ft/s} + (-32.2 \text{ ft/s}^2)(.8) =$   
 $\boxed{32.24 \text{ ft/s}}$

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B) P: What is the position of the ball at .8 seconds?

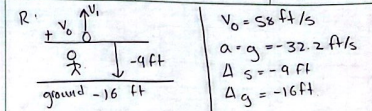


C:  $s_T = s_0 + v_0 T + \frac{1}{2} (a) (T)^2$   
 $s_T = 0 + 58(0.8) + \frac{1}{2} (-32.2)(.8)^2 = -16.304$   
 $\text{16 ft} + -16.304 = \text{36.096 ft}$

C: P: How long does it take for the ball to reach its highest point?

C:  $v_1 = v_0 + a \cdot T = 58 + (-32.2)(t)$   
 $-58 / -32.2 = -1.8 T$

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Eqns:  $s_1 = s_0 + v_0 T + \frac{1}{2} a T^2$ ,  $s_1 = s_0 + \left( \frac{v_1^2 - v_0^2}{2a} \right)$

D) P: How long does it take from when ball until it passes Dr. Perlmutter's throw the find Dr. kit?

C: use initial conditions and find time to find Dr. kit

$T_k = ?$   $\Delta s_k = v_0 T + \frac{1}{2} a T^2$

$0 = (s_k - s_0) + v_0 T + \frac{1}{2} a T^2$

$0 = (-9 \text{ ft} - 0 \text{ ft}) + 58 \text{ ft/s} (T) + \frac{1}{2} (-32.2 \text{ ft/s}^2) (T)^2$   
unknown unknown

$a = -17$ ,  $B = 58$   
 $C = -9$  setup via quadratic formula.

$\frac{-(58) \pm \sqrt{(58)^2 - 4(-16)(-9)}}{2(-16)} = t = 3.77 \text{ sec}$

F)  $s_g = s_0 + \left( \frac{v_g^2 - v_0^2}{2a} \right) = (s_g - s_0) \cdot 2a =$   
 $v_g^2 - v_0^2$   
 $v_g = \sqrt{(s_g - s_0) \cdot (2a)} + v_0^2 = \boxed{-66.3 \text{ ft/s}}$