SLH= = = = = + Vot + S

Sec. 2.2 MORE Applications

Name Answer Key

Solve each problem by using calculus. Show all work!

2=-32ft/s². A pumpkin pie is dropped from a height of 75.0 feet. So

a. Write the position, velocity and acceleration equations. Show the relationship with differentiation.

b. How long does it take for the pie to hit the ground?

c. With what speed does the pie hit the ground? (No, the answer is not 0 ft/sec.)

2 = -3202. A frozen turkey is shot straight upward from the ground with a speed of 40.0ft/sec.

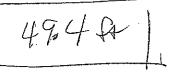
a. Write the position, velocity and acceleration equations. Show the relationship with differentiation.

$$S(\pm) = -16\pm^{2} + 40\pm$$

 $V(\pm) = -32\pm +40$
 $a(\pm) = -32$

b. How long does it take for the turkey to reach its peak height? $V(t_{-}) = 0$

c. What is the peak height of the turkey?

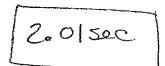


 $\alpha = -9.8 \text{ m/s}^3$. A bowl of cranberry sauce is thrown downward from a height of 60.0 m, with a speed of 20.0 m/s.

So=60.0m

a. Write the position, velocity and acceleration functions. Show the relationship with differentiation.

b. How long does it take for the cranberry sauce to hit the ground?



c. With what speed does it hit the ground?

 $\alpha = -9.8 \text{m/s}^4$. You are standing on the roof of a building, throwing stuffing balls upward $\frac{1}{2}$ from a height of 10.0 meters, with a speed of 15.0 m/s.

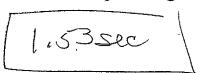
Vo= 15.0mg So=10.0m

a. Write the position, velocity and acceleration equations. Show the relationship with differentiation.

$$S(\pm)=-4.9\pm^{2}+15\pm+10$$

 $V(\pm)=-9.8\pm+15$
 $\alpha(\pm)=-9.8$

b. How long does it take for the stuffing ball to reach its peak height?



c. What is the peak height of the stuffing balls?

50=44.1 m

2= -9.8 m. A mincemeat pie is dropped from a height of 44.1 meters.

a. Write the position, velocity and acceleration equations. Show the relationship with differentiation

$$S(\pm) = -4.9 \pm^2 + 44.1$$

 $V(\pm) = -9.8 \pm$
 $a(\pm) = -9.8$

b. How long does it take for the pie to hit the ground?

c. With what speed does the pie hit the ground?

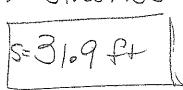
1= -9, Em/6, A ham is shot straight upward from the ground with a speed of 25.0m/sec. a. Write the position, velocity and acceleration equations. Show the

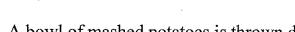
relationship with differentiation.

$$S(t) = -4.9t^2 + 25t$$

V(t) = -9.8t + 25b. How long does it take for the ham to reach its peak height?

c. What is the peak height of the ham?





- 7. A bowl of mashed potatoes is thrown downward from a height of 85.0 ft, a = -32 % with a speed of 10.0 ft/s.

 $\sqrt{0} = -10.0$ Write the position, velocity and acceleration functions. Show the So = 85.0 ff relationship with differentiation.

$$S(t) = -16t - 10t + 85$$

 $V(t) = -32t - 10$
 $a(t) = -32$

b. How long does it take for the bowl of mashed potatoes to hit the ground?

- L= 2,015ec
- c. With what speed does the bowl hit the ground?

- $\lambda = -32008$. You are standing on the roof of a building, throwing popcorn balls upward from a height of 12.0 feet, with a speed of 24.0 ft/s.
- $\sqrt{o} = 24.0 \text{ fg}$ a. Write the position, velocity and acceleration equations. Show the relationship with differentiation. Sn=12,0A

$$S(t) = -16t^2 + 24t + 12$$

 $V(t) = -32t + 24$
 $a(t) = -32$

b. How long does it take for the popcorn ball to reach its peak height?

c. What is the peak height of the popcorn balls?