Calculus Name_____

Position – Velocity – Acceleration Supplement Day6

1. A projectile is shot upward from the surface of the earth with an initial velocity of 120 $\frac{m}{\text{sec}}$. What is the velocity after 5 seconds?

2. A silver dollar is dropped from the top of a skyscraper that is 1362 feet tall.

a. Find the position equation.

b. Find the velocity equation.

c. Find the time required for the coin to reach the ground.

d. What is the velocity at impact?

3. A slingshot launches a stone vertically with an initial velocity of 300 $\frac{ft}{\text{sec}}$ from an initial height of 6 feet.

a. Find the position equation.

b. Find the velocity equation.

c. What is the stone's max height and when does it reach that height?

Answers:

1. $v(5) = 71\frac{m}{s}$

2. a. $s(t) = 1362 - 16t^2$ b. $v(t) = -32t$ c. $t = 9.226 \text{ sec}$ d. $v(9.226) = -295.242\frac{ft}{\text{sec}}$

3. a. $s(t) = 6 + 300t - 16t^2$ b. $v(t) = 300 - 32t$ c. $When: t = 9.375$ $What: 1412.25\ ft$

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4. A stone is tossed vertically upward with an initial velocity of 25 $\frac{ft}{\sec}$ from the top of a 30 foot building.

a. Find the position equation.

b. Find the velocity equation.

c. What is the height after .25 sec?

d. Find the velocity of the stone after 1 sec?

e. When does the stone hit the ground?

f. What is the velocity of the stone at impact?

5. The position of an object is given by $s(t) = 2t^3 - 9t^2 + 12t$ where t is in seconds ($t \geq 0$) and t is in seconds and s is in meters.

a. When is the particle at rest?

b. When is the particle moving forward? backward?

d. When is the particle speeding up? Slowing down?

Answers:

4 a $s(t) = 30 + 25t - 16t^2$ b $v(t) = 25 - 32t$ c $s(.25) = 35.25\ ft$ d $v(1) = -7\frac{ft}{s}$ e $t = 2.358$ sec f $v(2.358) = -50.456\frac{ft}{s}$

5 a $t = 1 \& 2$ sec b *forward* : $(0,1) \& (2,\infty)$ *backwards* : $(1,2)$ c *Speeding Up* : $(1,1.5) \& (2,\infty)$ *Slowing Down* : $(0,1) \& (1.5,2)$