AP Calc AB

Related Rates / PVA

Quiz Review

1. A conical tank (vertex down) is being drained at a rate of 67 *ft*3/ *sec*. The tank is 70 feet deep and measures 30 feet across the top. How fast is the water level decreasing when the tank is half full?

2. A 26 foot ladder leans against a wall. The base of the ladder is being pushed toward the house at a rate of 1.8 feet / sec. when the top of the ladder is 10 feet off the ground, find the following:

A) How fast the top of the ladder is moving.

B) How fast the angle between the ladder and the ground is changing.

3. A spherical balloon is being inflated at a rate of 2.4 *in*3 / *sec*. How fast is the radius of the balloon changing when the rate of change of the volume is equal to the rate of change of the volume is equal to the rate of change of the surface area?

4. A stone is dropped into a still pond and causes a circular ripple. The radius of the outermost ripple increases at a rate of 2.6 inches per second. At what rate is the area of the disturbed water changing when the radius of the outermost ripple is 8.9 inches?

5. A particle moves along a horizontal path such that its position (in feet) at any given time (in seconds) is given by the function.

A) What are the velocity and acceleration functions?

B) When is the particle at rest?

C) When is the particle moving right? Left?

D) What is the velocity of the particle when the acceleration is -18 *ft / sec2*

E) What is the position of the particle when the acceleration and velocity have the same

value?

F) What is the total distance and displacement of the particle in the first 8 seconds?

G) Sketch a motion schematic.

H) What is the initial position, velocity and acceleration?

I) What is the average velocity of the particle for the first 10 seconds?

6. A rocket is launched off a 78 foot cliff at a rate of 104 feet/second.

A) What are the position, velocity and acceleration functions?

B) When will the rocked hit the ground at the base of the cliff?

C) What is the impact velocity for the rocket?

D) What is the rocket’s maximum height?

E) How far did the rocket travel for its entire flight?