

C12 - 4.1 - Related Rates Review

Geometry

A Pebble is dropped into a pool and a circular ripple is created. How is the area of the circle changing when the radius is 2m if the radius is increasing at $3 \frac{m}{s}$.

The sides of a cube are increasing at $0.5 \frac{cm}{s}$. How fast is the volume increasing when the sides are 10cm. How fast is the surface area changing when the sides are 5cm.

A spherical water balloon loses water at a rate of $3\pi \frac{in^3}{min}$, find the rate the radius is changing when the radius is 5cm.

The radius of a sphere is increasing at $2 \frac{cm}{s}$ when the surface area is $36\pi cm^2$. Find the rate the volume is changing at that time.

The base of a triangle is increasing at a rate of $2 \frac{cm^2}{s}$ and the height of a triangle is decreasing at a rate $3 \frac{in^2}{s}$. Find the rate the area of the triangle changing when the height is 5 cm and the area is $20cm^2$.

Two adjacent sides of a triangle are 6 m and 5m and the angle between them is increasing at a rate of $\frac{\pi rad}{5 s}$. How fast is the area of the triangle changing when the angle is $\frac{\pi}{6}$.

Snow is being added to a snowball at a rate of $18\pi \frac{in^3}{min}$, find the rate of change of the surface area when the radius is 30cm.

Similar Triangles

A 5 foot tall woman is walking at a rate of $1 \frac{m}{s}$ towards a lamp post 6 meters tall. How fast is the length of the shadow changing? How fast is the tip of the shadow moving?

A person walks along a tightrope 30m above the ground between 2 trees 100m tall. Their shadow from above the tree shining on the ground between the two trees. How fast is the shadow growing when they are half way across.

Geometry/Similar Triangles

A cone with a radius of 3 cm and height of 6 cm is filling with water where the height of the water level is increasing at a rate of 0.2 cm/s. What is the rate the volume is increasing when the height of the water level is 5 cm.

Pythag

Train 'a' leaves Vancouver heading South at 10 m/s and one minute later train 'b' leaves heading East at 5 m/s? How far are they apart after two minutes? What is the speed at which the trains are moving apart at that time?

Pythag/Trig

The top of a 16 ft ladder slides down a wall at a rate of 3 ft/s. At what rate is the base of the ladder sliding away from the wall when the latter is at a height of 8 ft on the wall. What is the rate the angle at the bottom of the ladder changing at that time?

Any fisherman sits on a dock 6 meters above the ocean and reels in the fishing line at a rate of. How fast is the fish moving horizontally towards the dock when the string is 10 meters. How fast is the angle between the string and the ocean changing when the string is 10 meters long.

A lighthouse that rotates 3 revolutions per minute is directly 2 km from a person on shore. How fast is the light sweeping along the shore 4 kilometers down from the person and at the person?

Cosine Law

A float plane rising at 30 degrees above the horizontal flies over a boat at an altitude of 100 m at 60 m/s. How fast is the distance between the boat and the plane increasing after five seconds?