

Related rates

4.9.1

The surface area of a cube is increasing at $4 \text{ m}^2/\text{s}$. Find the rate at which the volume of this cube is increasing when the length of the side is 10 m .

4.9.2

A conical paper cup with diameter of 8 cm across the top and 6 cm deep is full of water. The cup springs a leak at the very bottom tip and loses water at the rate of $2 \text{ cm}^3/\text{min}$. How fast is the radius of the top of the water in the cup changing when the water is 3 cm deep?

4.9.3

A particle moves on the parabola $y = x^2 - 2x + 2$, x and y measured in meters. When the particle is at the point $(2, 2)$, its x -coordinate is decreasing at 0.5 m/s . How fast is the distance from the particle to the point $(3, 0)$ changing at this moment?