

Exercise 1. A stone dropped into a pond at time $t = 0$ causes a circular ripple that travels out from the point of impact at 5 m/s. At what rate is the area within the ripple increasing when its radius is 25 m?

Exercise 2. At a nearby quarry, a conveyor belt pours sand onto a pile at a rate of $2 \text{ ft}^3/\text{s}$. As it build up, the pile takes the shape of a right circular cone. How quickly is the radius of the pile increasing when the pile is 10 feet across?

Exercise 3. Air is being pumped into a spherical balloon at a rate of $500 \text{ in}^3/\text{s}$. How quickly is the radius of the balloon increasing when the balloon contains $500\pi \text{ in}^3$ of air?