

1. The area of a circle changes at a rate of $20 \text{ in}^2/\text{s}$. Find the rate of change of the circle's radius when the radius is $r = 3$.
2. A 13 foot ladder leaning against a building slowly slips down towards the ground at 2.5 ft/s . If the ladder was 5 feet away from the building, find the rate at which the ladder slides along the ground.

3. A rock is thrown into a still pond. Circular ripples move outward from the impact spot so that the radius of the circle increases at the rate of 2 ft/min. Find the rate at which the area is changing when the radius is 4 ft.

4. An ice cube that is 3 cm on each side is melting at a rate of $2 \text{ cm}^3/\text{min}$. How fast is the length of the side decreasing?