

Calculus I

Section 2.6 Homework

1) Let A be the area of a circle whose radius is r .

Assume that r is increasing at a constant rate of 7 inches per minute

Hint: $A = \pi r^2$;

- How are the rate of change of A (dA/dt) and rate of change of r (dr/dt) related?
- At the instant when $r = 4$, what is the rate of change of the area (A)?

2) Hint: $V = \text{volume of sphere} = \frac{4}{3}\pi r^3$;

Assume that r is increasing at a constant rate of 3 inches per minute

- How are the rate of change of V (dV/dt) and rate of change of r (dr/dt) related?
- At the instant when $r = 4$, what is the rate of change of the volume (V)?

3) Let $A = \text{area of a square whose sides have length } s$.

Assume that s is increasing at a constant rate of 2 inches per minute

- How are the rate of change of A (dA/dt) and rate of change of s (ds/dt) related?
- At the instant when $s = 4$, what is the rate of change of the area (A)?

4) A rock dropped into a still pond sends out a circular ripple whose radius increases at a constant rate of 5ft/sec. How fast is the area (enclosed by the ripple) increasing at the instant when the radius is 7 ft?