Section 4.4 Related Rates (Minimum Homework: 1, 3, 5, 7)

1) A pebble is dropped into a calm pond causing ripples in the form of concentric circles. The radius *r* of the outer ripple is increasing at a constant rate of 1 foot per second. When the radius is 4 feet, at what rate is the total area of the disturbed water changing?

2) A pebble is dropped into a calm pond causing ripples in the form of concentric circles. The radius *r* of the outer ripple is increasing at a constant rate of 1 foot per second. When the radius is 3 feet, at what rate is the total area of the disturbed water changing?

3) A pebble is dropped into a calm pond causing ripples in the form of concentric circles. The radius *r* of the outer ripple is increasing at a constant rate of 3 feet per second. When the radius is 5 feet, at what rate is the total area of the disturbed water changing?

4) A pebble is dropped into a calm pond causing ripples in the form of concentric circles. The radius *r* of the outer ripple is increasing at a constant rate of 4 feet per second. When the radius is 7 feet, at what rate is the total area of the disturbed water changing?

5) Air is being pumped into a spherical balloon at 10 cm^3/minute. Calculate the rate at which the radius of the balloon is changing when the radius of the balloon is 6 cm.

6) Air is being pumped into a spherical balloon at 2 cm^3/second. Calculate the rate at which the radius of the balloon is changing when the radius of the balloon is 3 cm.

7) Air is being pumped into a spherical balloon at 3 cm^3/minute. Calculate the rate at which the radius of the balloon is changing when the radius of the balloon is 8 cm.

8) Air is being pumped into a spherical balloon at 9 cm^3/second. Calculate the rate at which the radius of the balloon is changing when the radius of the balloon is 12 cm.