

Practice (Homework)

1. A spherical balloon is deflated so that its radius decreases at a rate of 4 cm/sec. At what rate is the volume of the balloon changing when the radius is 3 cm?
2. A spherical balloon is deflated at a rate of $256\pi/3$ cm³/sec. At what rate is the radius of the balloon changing when the radius is 8 cm?
3. Water leaking onto a floor forms a circular pool. The radius of the pool increases at a rate of 9 cm/min. How fast is the area of the pool increasing when the radius is 12 cm?
4. A 13 ft ladder is leaning against a wall and sliding towards the floor. The top of the ladder is sliding down the wall at a rate of 7 ft/sec. How fast is the base of the ladder sliding away from the wall when the base of the ladder is 12 ft from the wall?
5. Oil spilling from a ruptured tanker spreads in a circle on the surface of the ocean. The radius of the spill increases at a rate of 2 m/min. How fast is the area of the spill increasing when the radius is 13 m?
6. An observer stands 500 ft away from a launch pad to observe a rocket launch. The rocket blasts off and maintains a velocity of 700 ft/sec. Assume the scenario can be modeled as a right triangle. How fast is the observer to rocket distance changing when the rocket is 1200 ft from the ground?
7. A spherical snowball melts at a rate of 36π in³/sec. At what rate is the radius of the snowball changing when the radius is 5 in?
8. Water slowly evaporates from a circular shaped puddle. The radius of the puddle decreases at a rate of 8 in/hr. Assuming the puddle retains its circular shape, at what rate is the area of the puddle changing when the radius is 3 in?
9. A hypothetical square grows so that the length of its diagonals are increasing at a rate of 4 m/min. How fast is the area of the square increasing when the diagonals are 14 m each?
10. A hypothetical cube grows so that the length of its sides are increasing at a rate of 4 m/min. How fast is the volume of the cube increasing when the sides are 7 m each?