~~Practice~~ (Homework)

KEY

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?

$-144\pi \text{ cm}^3/\text{sec}$

2. A spherical balloon is deflated at a rate of 256π/3 cm³/sec. At what rate is the radius of the balloon changing when the radius is 8 cm?

$-\frac{1}{3}$ cm/sec

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?

$216\pi \text{ cm}^2/\text{sec}$

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?

$\frac{35}{12}$ ft/sec

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?

$52\pi \text{ m}^2/\text{min}$

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? $\frac{8400}{13}$ ft/s

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?

$\frac{-9}{25}$ in/sec

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?

$-48\pi \text{ in}^2/\text{hr}$

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?

$56 \text{ m}^2/\text{min}$

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?

$588 \text{ m}^3/\text{min}$