# Some Practice

1. Water runs into a conical tank at a rate of $9\,\text{ft}^3/\text{min}$. The tank stands point down and has a height of 10 ft and a base radius of 5 ft. How fast is the water level rising when the water is 6 ft deep?

2. A spherical iron ball is coated with a layer of ice of uniform thickness. If the ice melts at the rate of 8 mL/min, how fast is the outer surface area of ice decreasing when the outer diameter (ball plus ice) is 20 cm?

3. A man 6 ft tall walks at the rate of 5 ft/sec toward a streetlight that is 16 ft above the ground. At what rate is the length of his shadow changing when he is 10 ft from the base of the light?

4. *A* and *B* are walking on straight streets that meet at right angles. *A* approaches the intersection at 2 m/sec and *B* moves away from the intersection at 1 m/sec, as shown in the figure. At what rate is the angle θ changing when *A* is 10 m from the intersection and *B* is 20 m from the intersection?
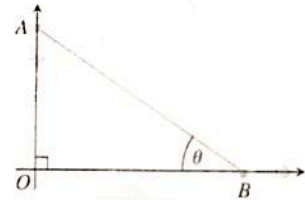
5. . If $f(x) = \dfrac{8}{x^3}$ and $f(g(x)) = x$, what is the value of $g'(1)$?