Implicit Differentiation and Related Rates - Worksheet

1. Find $\dfrac{dy}{dx}$ by implicit differentiation.

   (a) $\dfrac{1}{x} + \dfrac{1}{y} = 1$

   (b) $x^3 + x^2 y + 4y^2 = 6$

   (c) $x^2 y^2 + x \sin(y) = 4$

2. A ladder 10ft long rests against a vertical wall. If the bottom of the ladder slides away from the wall at a rate of 1ft/s, how fast is the top of the ladder sliding down the wall when the bottom of the ladder is 6ft from the wall?

3. A baseball diamond is a square with side of 90ft. A batter hits the ball and runs toward first base with a speed of 24ft/s. At what rate is his distance from second base decreasing when he is halfway to first base?