

Show all work. Your answers must be fully justified.

1. A 10 foot ladder is leaning against a wall. The ladder begins to slip so that the bottom of the ladder slides along the floor away from the wall at a speed of 1 foot per second. How fast is the top of the ladder sliding down the wall at the instant that the foot of the ladder is 6 feet from the wall?

2. Let a curve be implicitly defined by $x^2y^2 + y^3 = 6x - 8$.

(a) Find $\frac{dy}{dx}$.

- (b) Find the equation of the tangent line to the curve at the point where $x = 0$.

(c) Find $\frac{d^2y}{dx^2}$. (You do not need to simplify and you may leave $\frac{dy}{dx}$ in your answer.)