

Show all work clearly and in order (on this sheet or an attached sheet) and circle your final answers.

Justify your answers algebraically whenever possible. Work without justification may not receive credit.

You have 25 minutes to take this 10 point quiz.

1. (3 points) Find $\frac{dy}{dx}$ when $x^2 + 3xy + 4y^2 = 9x^2y^2$.

2. (3 points) Suppose that η is a function of α (i.e. $\eta = \eta(\alpha)$). Find $\frac{d\eta}{d\alpha}$ when $\sin(\alpha) + 3\eta\alpha^2 + 5 = \cos(\eta)$.

3. (4 points) A ladder 5 feet long rests against a vertical wall. If the bottom of the ladder slides away from the wall at a rate of $2\frac{ft}{s}$, how fast is the top of the ladder sliding down the wall when the bottom of the ladder is 2 feet from the wall?

a.) Draw a picture representing this situation below.

b.) Label all variables that change with time and the given rate expressed as a derivative with respect to time.

c.) What equation do you need to differentiate for this problem, and what is it after you differentiate?

Before:

After:

d.) Give me the final answer to the question in sentence form.