

1. Find $\frac{dy}{dx}$ given that $x^2y^3 + 2y = 3x$.

2. When the price of a water bottle is p dollars per unit, producers are willing to supply x hundred bottles, where $3p^2 - 2x^2 = 60$. How fast is the supply x changing with respect to time t when the unit price is \$6 and is increasing at a rate of 80 cents per month? (That is, $\frac{dp}{dt} = 0.8$.)

3. Consider the relation $x^2 - y^2 = 2x + 4y$.

- a) Find all points on $x^2 - y^2 = 2x + 4y$ where the tangent line is horizontal. (Hint: Find $\frac{dy}{dx}$ and then figure out where $\frac{dy}{dx} = 0$.)

- b) Now find all points on $x^2 - y^2 = 2x + 4y$ where the tangent line is vertical. (Hint: When would $\frac{dy}{dx}$ be undefined?)

Q: What word starts with "e" and has only one letter in it?