Implicit Differentiation and Related Rates.

(1) Evaluate \( \frac{d}{dx} \left( 3x^3y^2 + \frac{1}{2}x^4\sqrt{y} \right) \)

(2) Evaluate \( \frac{d}{dx} \frac{12x^2y + y^4x}{16y^2} \)

(3) Find \( \frac{dy}{dx} \) if \( x^3 + y^{3/2} + 4xy = 10x \)

(4) Find \( \frac{dz}{dt} \) if \( z = x^3y^2 - 2x^4y^6 \) when \( x = 6, y = 2, \frac{dx}{dt} = -5, \frac{dy}{dt} = 4 \)

(5) A tank in the shape of a cone is full of water. The top of the tank has a radius of 5 feet and the tank is 10 feet tall. A pump is draining the tank at a rate of 3 cubic feet per minute. How fast is the water level falling when the water is 2 feet deep?