

Implicit Differentiation

1. Assume that y is a function of x . Find $\frac{dy}{dx}$ in the following:

(a) $x^3 + y^3 = 8$

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

(c) $y = \sin(2x + 5y)$

(d) $e^{xy} = e^{3x} - e^{4y}$

2. Let C be the graph of a circle centered at $(1, 0)$ with radius 3.
- Write down the equation of the circle C that you are working with.
 - Find the equation(s) of line tangent to C at $x = 2$.
 - Find the point that the above line crosses the x -axis.
3. A ladder is 10 feet long and leaning against a wall with its base x feet away from the base of the wall.
- Draw a picture of the situation described above and label y as the vertical distance from the tip of the ladder to the floor.
 - Find a relationship between x and y .
 - Find the rate that the vertical distance is moving as you change the horizontal distance.