

Class Okuba Zerechere

Civil Engineering

19/ENGT03/017

MAT 102

1 Equation of Circle =  $x^2 + y^2 - 5x - y + 4 = 0$  where  $x_1 = 1, y_1 = 0$

$$\Rightarrow 2x + 2y \frac{dy}{dx} - 5 - \frac{dy}{dx} = 0$$

$$(2y - 1) \frac{dy}{dx} = 5 - 2x$$

$$m = \frac{dy}{dx} = \frac{5 - 2x}{2y - 1}$$

$$\frac{dy}{dx} = \frac{2y - 1}{5 - 2x}$$

$$= \frac{5 - 2(1)}{2(0) - 1} = \frac{5 - 2}{0 - 1} = \frac{3}{-1} = -3$$

$$\frac{2(0) - 1}{0 - 1} = -1$$

$$y - y_1 = m(x - x_1)$$

$$y - 0 = -3(x - 1)$$

$$y = -3x + 3$$

2  $x^2 + y^2 - 12x - 12y + 47 = 0$  where  $x_1 = 1, y_1 = 0$

$$\Rightarrow 2x + 2y \frac{dy}{dx} - 12 - 12 \frac{dy}{dx} = 0$$

$$(2y - 12) \frac{dy}{dx} = 12 - 2x$$

$$m = \frac{dy}{dx} = \frac{12 - 2x}{2y - 12}$$

$$m = \frac{12 - 2(1)}{2(0) - 12} = \frac{12 - 2}{-12} = \frac{10}{-12} = -\frac{5}{6}$$

$$\frac{2(0) - 12}{-12} = -1$$

$$y - y_1 = m(x - x_1)$$

$$y - 0 = -\frac{5}{6}(x - 1)$$

$$y = -\frac{5}{6}x + \frac{5}{6}$$

$$y = \frac{5-5x}{6}$$

$$6y = 5-5x$$

$$6y + 5x - 5 = 0$$

$$3) \quad 2x^2 + y^2 + 8x + 14y + 40 = 0 \quad x_1 = 1 \quad y_1 = 0$$

$$2x + 2y \frac{dy}{dx} + 8 + 14 \frac{dy}{dx} = 0$$

$$(2y + 14) \frac{dy}{dx} = 8 - 2x$$

$$m = \frac{dy}{dx} = \frac{8-2x}{2y+14}$$

$$\frac{2y+14}{2(y+7)} = \frac{4-1}{0+7} = \frac{3}{7}$$

$$y - y_1 = m(x - x_1)$$

$$y - 0 = \frac{3}{7}(x - 1)$$

$$y = \frac{3x}{7} - \frac{3}{7}$$

$$y = \frac{3x-3}{7}$$

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$$7y = 3x - 3$$

$$7y - 3x + 3 = 0$$