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MATH 102 ASSIGNMENT

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

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

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

$$\frac{dy}{dx} = \frac{5-2x}{2y-1} = m = \frac{5-2(1)}{2(0)-1} = \frac{5-2}{0-1} = \frac{3}{-1} = -3$$

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

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

$$\underline{\underline{y = -3x + 3}}$$

② Equation of circle $= x^2 + y^2 - 12x - 12y + 47 = 0$ · $x_1 = 1$ $y_1 = 0$

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

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

$$\frac{dy}{dx} = \frac{12-2x}{2y-12} = m = \frac{12-2(1)}{2(0)-12} = \frac{12-2}{0-12} = \frac{\overset{5}{\cancel{10}}}{\cancel{-12}_{6}} = \frac{-5}{6}$$

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

~~$y - 0 = m(x - x_1)$~~ $y - 0 = \frac{-5}{6}(x - 1)$

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

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

$$6y = 5 - 5x$$

$$\underline{6y + 5x - 5 = 0}$$

$2y\frac{dy}{dx} + 2g + 2f\frac{dy}{dx}$

$2f)\frac{dy}{dx} = -2x - 2g$

$= \frac{-2x - 2g}{2y + 2f}$] Slope of tangent at $P(x_1, y_1)$

$\dots x^2 - 4y^2 - 12x + 24y = 55 = 0$
circle, we have

$(-3/2,$

differenti

$8x^2 + 8y$

$(8y + 2$

$\frac{dy}{dx} =$

$\frac{dy}{dx}$

③ Equation of circle $= x^2 + y^2 - 8x + 14y + 40 = 0 \quad x_1 = 1 \quad y_1 = 0$

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

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

$\frac{dy}{dx} = \frac{8 - 2x}{2y + 14} = \frac{2(4-x)}{2(y+7)} = m = \frac{4-1}{0+7} = \frac{3}{7}$

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

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

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

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

$7y = 3x - 3$

$7y - 3x + 3 = 0$