

Benda Otomotif T01use

19/210/030

1) point (1,0) at  $x^2 + y^2 - 5x - y + 4 = 0$

Comparing given equation with equation of a circle

$$x^2 + y^2 - 5x - y + 4 = 0$$

$$x^2 + y^2 + 2fx + 2gy + c = 0$$

$$2fx = -5x, \quad 2gy = -y$$

$$f = -\frac{5}{2}, \quad g = \frac{-1}{2} = -\frac{1}{2}, \quad c = 4$$

$$\therefore xx_1 + yy_1 + f(x+x_1) + g(y+y_1) + c$$

Input the values of f and g in the general equation

$$xx_1 + yy_1 + \left(-\frac{5}{2}\right)(x+x_1) + \left(-\frac{1}{2}\right)(y+y_1) + 4 = 0$$

$$xx_1 + yy_1 + \frac{-5}{2}(x+x_1) - \frac{1}{2}(y+y_1) + 4 = 0$$

Make  $x_1 = 1$  and  $y_1 = 0$

$$x + 0 - \frac{5}{2}x + \frac{5}{2} - \frac{1}{2} + 0 + 4 = 0$$

$$x - \frac{5}{2}x - \frac{1}{2} + 4 = 0$$

$$= -\frac{3x}{2} + \frac{1}{2} = 0$$

∴ Equation of the tangent =  $-\frac{3x}{2} + \frac{1}{2} = 0$

2 points (1,0), on the circle  $x^2 + y^2 - 12x - 12y + 47 = 0$

Comparing the equations

$$2fx = -12x, \quad 2gy = -12y$$

$$f = -6, \quad g = -6$$

$$\therefore xx_1 + yy_1 + f(x+x_1) + g(y+y_1) + c = 0$$

$$xx_1 + yy_1 + (-6)(x+x_1) + (-6)(y+y_1) + c = 0$$

Make  $x_1 = 1$  and  $y_1 = 0, c = 47$

$$x + 0 - 6(x+1) - 6(y+0) + 47 = 0$$

$$x + 0 - 6x - 6 - 6y - 0 + 47 = 0$$

$$x - 6x - 6y + 47 - 6 = 0$$

$$-5x - 6y + 41 = 0$$

3) point  $(1, 0)$  on the circle  $x^2 + y^2 - 8x + 14y + 40 = 0$

Comparing equations

$$x^2 + y^2 - 8x + 14y + 40 = 0$$

$$x^2 + y^2 + 2fx + 2gy + c = 0$$

$$2fx = -8x \quad , \quad 2gy = 14y$$

$$f = -4 \quad g = 7$$

$$\therefore ax + by + f(x+x_1) + g(y+y_1) + c = 0$$

$$xx_1 + yy_1 + f(x+x_1) + g(y+y_1) + c = 0$$

Make  $x_1 = 1$ ,  $y_1 = 0$ ,  $c = 40$

$$x + 0 + x + 0 - 4(x+1) + 7(y+0) + 40 = 0$$

$$x + 0 - 4x - 4 + 7y + 0 + 40 = 0$$

$$x - 4x + 7y + 40 - 4 = 0$$

$$-3x + 7y + 36 = 0$$