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MAT 102 Elect/Elect Engineering 19/ENG041052

NO 032

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

und  $x^2 + y^2 + 2gx + 2fy + c = 0$

$2g = -5$      $2f = -1$

$g = -\frac{5}{2}$      $f = -\frac{1}{2}$      $g_1 = -g = \frac{5}{2}$      $f_1 = -f = \frac{1}{2}$

$m_1 = \frac{\frac{1}{2} - 0}{\frac{5}{2} - 1} = \frac{0.5 - 0}{2.5 - 1} = \frac{0.5}{1.5} = \frac{5}{15} = \frac{1}{3}$

$m_1 m_2 = -1$

$m_2 = -\frac{1}{m_1} = -1 / \frac{1}{3} = -3$

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

$y = -3x + 3$

$\therefore y + 3x - 3 = 0$  is the equation of the tangent

2  $x^2 + y^2 - 12x - 12y + 47 = 0$

$2g = -12$      $g = -\frac{12}{2} = -6$

$2f = -12$      $f = -\frac{12}{2} = -6$

$m_1 = \frac{-6 - 0}{6 - 1} = \frac{6}{5}$

$m_2 = -\frac{1}{m_1} = -\frac{1}{\frac{6}{5}} = -\frac{5}{6}$

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

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

$\therefore 6y + 5x - 5 = 0$  multiply all by 6 is the equation of the tangent

$$3 \quad x^2 + y^2 - 8x + 14y + 40 = 0$$

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

$$x: \quad 2f = -8 \quad f = -8/2 = -4$$

$$2g = 14 \quad g = 14/2 = 7$$

~~$m = \frac{f}{g}$~~

$$m_1 = \frac{4 - 0}{-7 - 1} = \frac{4}{-8} = -\frac{1}{2}$$

$$m = \frac{-1}{m_1} = \frac{-1}{-\frac{1}{2}} = 2$$

$$y - 0 = 2(x - 1)$$

$$y = 2x - 2$$

~~$y + 2x$~~   $y - 2x + 2 = 0$

$\therefore y - 2x + 2 = 0$  is the equation of the tangent