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Elect/Elect Eng
19/ENG04/004

S/N · 12

MAT 102

(1.) $x^2 + y^2 - 5x - y + 4 = 0$; (1, 0)

Find eqtn of tangents

Solution

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

General Eqtn: $x^2 + y^2 + 2gx + 2hy + c = 0$

$xx_1 + yy_1 + 2g(x + x_1) + 2h(y + y_1) + c = 0$

$g = -5/2$ $\quad x_1 = 1$

$h = -1/2$ $\quad y_1 = 0$

$c = 4$

Hence,

$x + 0 + -5/2(x+1) + -1/2(y+0) + 4 = 0$

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

$2x - 5x - 5 - y + 8 = 0$

$y = -3x + 3$

or

$3x + y - 3 = 0$

(2.) $x^2 + y^2 - 12x - 12y + 47 = 0$; $(1, 0)$

Solution

~~The centre C~~ $c = 47$

$x_1 = 1$ $g = -6$

$y_1 = 0$ $h = -6$

$$xx_1 + yy_1 - 6(x + x_1) - 6(y + y_1) + 47 = 0$$

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

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

or

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

(3.) $x^2 + y^2 - 8x + 14y + 40 = 0$; $(1, 0)$

$c = 40$; $g = -4$; $h = 7$

$x_1 = 1$; $y_1 = 0$

$$xx_1 + yy_1 - 4(x + x_1) + 7(y + y_1) + 40 = 0$$

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

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

or

$$7y = 3x - 36$$

$$y = 3/7x - 36/7$$