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Mat 102 Assignment

1 Find the equation of the tangent of the following:
At point (1, 0) on the circle $x^2+y^2-5x-y+4=0$

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

Comparing to the general eqn of a circle

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

$g=-5, f=-1, c=4$

$(x_1, y_1) = (1, 0)$

Eqn of tangent:

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

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

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

$-3x - y + 3 = 0$

Eqn of tangent $= -3x - y + 3 = 0$

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

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

Comparing to the general eqn of a circle

$g=-12, f=-12, c=47$

$(x_1, y_1) = (1, 0)$

Eqn of tangent

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

$2x(1) + 2y(0) + -12(x+1) + -12(y+0) + 2(47) = 0$

$2x - 12x - 12 - 12y + 94$

$-10x - 12y + 82 = 0$

divide through by 2

Eqn of tangent $= -5x - 6y + 41 = 0$

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

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

Comparing to the gen. eqn of a Circle

$$g=-8,\ f=14,\ c=40$$

$$(x_1,y_1)=(1,0)$$

Eqn of tangent

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

$$2x(1)+2y(0)+8(x+1)+14(y+0)+2(40)=0$$

$$2x-8x-8+14y+80=0$$

$$-6x+14y-72=0$$

divide through by 2

Eqn of tangent $= -3x+7y-36=0$