

NAME: EKWEOZOR CHUKAZA UCHENNA  
 DEPARTMENT: ELECTRICAL/ELECTRONICS ENGINEERING  
 MATRIC No.: 19/ENG04/015  
 MAT 102 ASSIGNMENT

(1.) Equation of circle =  $x^2 + y^2 - 5x - y + 4 = 0$   
 Points =  $(1, 0)$

Comparing  $x^2 + y^2 - 5x - y + 4 = 0$  and  $x^2 + y^2 + 2gx + 2fy + c = 0$   
 $2g = -5$        $2f = -1$   
 $g = -5/2$        $f = -1/2$       Centre  $(-g, -f) = (5/2, 1/2)$

$$m_1 = \frac{1/2 - 0}{5/2 - 1} = \frac{1/2}{3/2} = \frac{1}{3}$$

$$m_1 m_2 = -1$$

$$m_2 = -1/m_1 = -1 \div 1/3 = -3$$

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

$$y = -3x + 3$$

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

(2.) Equation of circle =  $x^2 + y^2 - 12x - 12y + 47 = 0$   
 Points =  $(1, 0)$

Comparing  $x^2 + y^2 - 12x - 12y + 47 = 0$  and  $x^2 + y^2 + 2gx + 2fy + c = 0$   
 $2g = -12$        $2f = -12$   
 $g = -6$        $f = -6$

$\therefore$  Centre =  $(6, 6)$

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

$$m_2 = -1/m_1 = -1 \div 6/5 = -5/6$$

$$y - 0 = -5/6(x - 1)$$

$$6(y - 0) = -5(x - 1)$$

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

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

(3.) Equation of circle =  $x^2 + y^2 - 8x + 14y + 40 = 0$       Points =  $(1, 0)$

$2g = -8$ ;  $g = -4$        $2f = 14$ ;  $f = 7$

Centre =  $(4, -7)$

$$m_1 = \frac{-7 - 0}{4 - 1} = \frac{-7}{3}$$

$$m_2 = -1 \div -7/3$$

$$m_2 = -1 \times -3/7 = 3/7$$

$$y - 0 = 3/7(x - 1)$$

$$7(y - 0) = 3(x - 1)$$

$$\therefore 7y = 3x - 3$$

$\therefore 7y - 3x + 3 = 0$  is the equation of the tangent