NAME: JIDEOFOR CHISOM GLORIA.
MATRIC NO: 19/MHS01/219
DEPARTMENT: MBBS.
COURSE CODE: MATH 104.

2) $y - 3x - 2 = 0$ and $3y + x + 9 = 0$

let $A = y - 3x - 2 = 0$

$= \frac{dy}{dx} - 3 = 0$

$= \frac{dy}{dx} = 3$

let $B = 3y + x + 9 = 0$

$3 dy/dx + 1 + 0 = 0$

$3 dy/dx + 1 = 0$

$dy/dx = -1/3$

$A + B$

i.e $y - 2x - 2 = 0$ is perpendicular to $3y + x + 9 = 0$

$3y - 4 = 2x + 3$ and $y - 5 = x + 6$

let $A - 3y - 4 = 2x + 3$

$3 dy/dx - 0 = 2 + 0$

$3 dy/dx = 2$

$dy/dx = 2/3$

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

$dy/dx - 0 = 1 + 0$

$dy/dx = 1$

$\therefore A \neq B$

ie $By - 4 = 2x + 3$ and $y - 5 = x + 6$ is not perpendicular.

(a) $x^2+y^2+3y-11=0$ at point $(1,2)$

$2x+2y\,dy/dx+3(x+dy/dx+y\times1)-0=0$

$2x+2y\,dy/dx+3x\,dy/dx+3y=0$

$2y\,dy/dx+3x\,dy/dx=-2x-3y$

$dy/dx=\frac{-2x-3y}{2y+3x}$

$m=\frac{dy}{dx}=-\frac{(2x+3y)}{2y+3x}$

when $x=1$ and $y=2$

$m=\frac{-[2(1)+3(2)]}{2(2)+3(1)}$

$=\frac{-(2+6)}{4+3}=-\frac{8}{7}$

$m=-8/7$

Equation of the tangent

$y-y_1=m(x-x_1)$

$y-2=-8/7(x+1)$

$y-2=-8x/7+8/7$

$7y-14=8x+8$

$8x+7y-14-8=0$

$8x-7y-22=0$

(b) equation of the normal to a curve

$y-y_1=-1/m(x-x_1)$

$y-2=-1/-8/7(x-1)$

$y-2=7/8(x-1)$

$y-2=7x/8-7/8$

$8y-16=7x-7$

$8y=7x-7+16$

$7x-8y+9=0$.