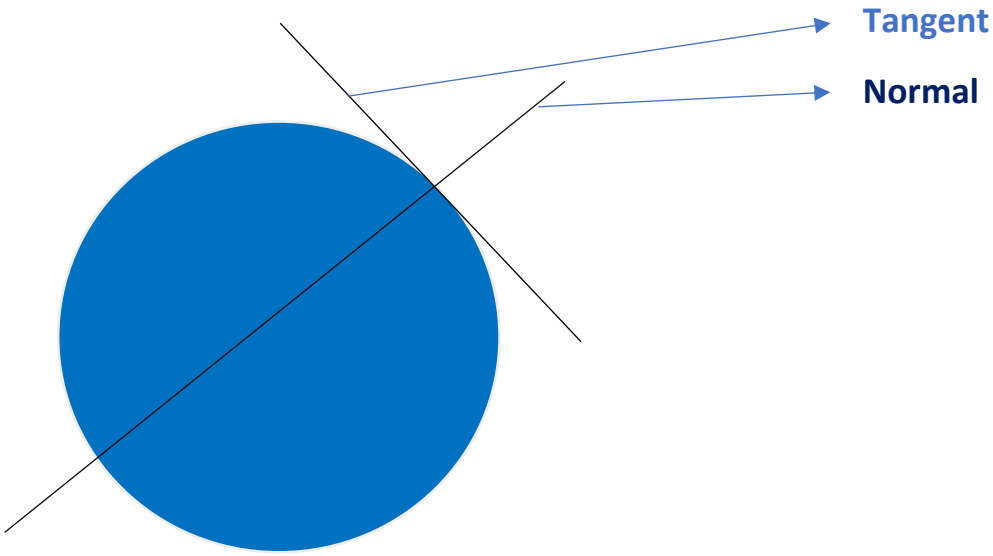
Brief points on lecture



a) A tangent to a circle is a straight line that touches the circle at only one point.
b) A Normal, is a straight line that is perpendicular to the tangent line.

⇨ If the circle is x^2+y^2=a^2

a) The equation of a tangent to the circle at (x_1, y_1) is given by $xx_1 + yy_1 = a^2$
b) The equation of normal to the circle at (x_1, y_1) is given by $yx_1 - xy_1 = 0$.
c) The equation of a tangent to the circle at $(a \cos \theta, a \sin \theta)$ is given by $x \cos \theta + y \sin \theta = a$
d) The equation of a normal to the circle at $(a \cos \theta, a \sin \theta)$ is given by $x \sin \theta - y \cos \theta = 0$.

⇨ If the circle is given by x^2+y^2+2gx+2fy+c=0

a) The equation of a tangent to the circle at (x_1, y_1) is $xx_1 + yy_1 + g(x + x_1) + f(y + y_1) + c = 0$
b) The equation of normal to the circle at (x_1, y_1) is $(y - y_1)/(y_1 + f) = (x - x_1)/(x_1 + g)$.

Condition for a line to be tangent:

⇒For a line y = mx + c to be a tangent to a circle x^2+ y^2 = a^2

it should satisfy $c = \pm a(\sqrt{(1+m^2)}$, the equation is given by **$y = mx \pm a(\sqrt{(1+m^2)}$.**

⇒ **Tangent and normal are perpendicular to each other**

⇒The length of the tangent from P(x1,y1) is (s1)^1/2 where s1 is **$x1^2+y1^2+2gx_1+2fy_1+c$.**