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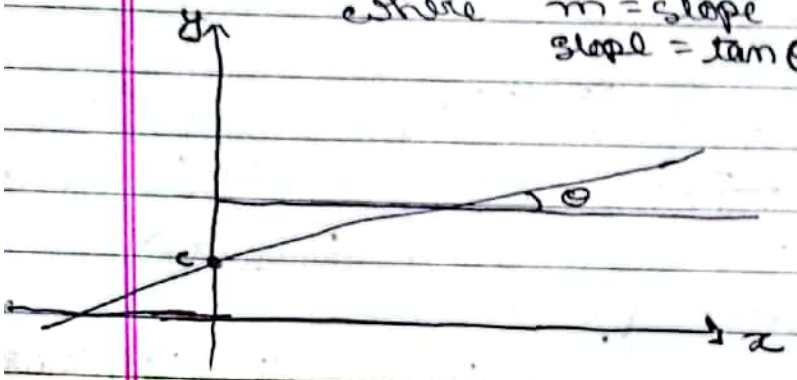
Linear Algebra (continued...)

* Eq^n of a line → $y = mx + c$ ∵ for 2-D

where m = slope , c = y intercept

slope = $\tan\theta$



2-D → line

3-D → plane

4D or nD → hyperplane

* 2D General form = $ax + by + c = 0$

$\Rightarrow by = -ax - c$

$y = -\frac{a}{b}x - \frac{c}{b}$ ∴ so, $\frac{-a}{b} = m$ ∴ $-\frac{c}{b} = c$

2-D

Actual general form = $w_1x_1 + w_2x_2 + w_0 = 0$

$\Rightarrow w_2x_2 = (-w_1x_1) + (-w_0)$

$x_2 = -\frac{w_1}{w_2}x_1 - \frac{w_0}{w_2}$

∴ So, $-\frac{w_1}{w_2} = m$ = slope = $\tan\theta$

& $-\frac{w_0}{w_2} = c = x_2$ intercept

3D general form → $w_1x_1 + w_2x_2 + w_3x_3 + w_0 = 0$

$x_2 = -\frac{w_1}{w_2}x_1 - \frac{w_3}{w_2}x_3 - \frac{w_0}{w_2}$

∴ So $-\frac{w_1}{w_2}$, $-\frac{w_3}{w_2}$ = slopes & $-\frac{w_0}{w_2}$ = slope

ND form → $w_1x_1 + w_2x_2 \cdots w_nx_n + w_0 = 0$

$\Rightarrow \sum_{i=0}^{n}(w_ix_i) + w_0 = 0$

∴ i.e. it looks like dot product ,