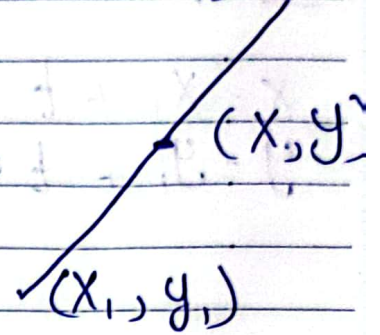


Vid 5

Line drawing Algorithms 4

1 Slope - InterCept Formula (x_2, y_2)

$$\text{ميل الخط} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{y - y_1}{x - x_1}$$



$$y = y_1 + x \left(\frac{y_2 - y_1}{x_2 - x_1} \right) - x_1 \left(\frac{y_2 - y_1}{x_2 - x_1} \right)$$

$$y = Mx + B$$

$$M = \frac{y_2 - y_1}{x_2 - x_1}$$

$$B = y_1 - \left(\frac{y_2 - y_1}{x_2 - x_1} \right) x_1$$

ex) $(10, 12) \rightarrow (40, 20)$

$$M = \frac{20 - 12}{40 - 10} = \frac{8}{30}$$

$$B = 12 - \left(\frac{8}{30} \right) 10 = 9 \frac{1}{3}$$

$$y = \left(\frac{8}{30} \right) x + \frac{28}{3}$$

وهذا
أقرب نقطة

[2]

Vid 6

[2] Parametric Form

$$x = x_1 + t(x_2 - x_1)$$

$$y = y_1 + t(y_2 - y_1)$$

$$0 \leq t \leq 1$$

↓
محدد على
نطاق 0 إلى 1

$t=0$	$t=1$
$x=x_1$	$x=x_2$
$y=y_1$	$y=y_2$

a) $(5, 10) \rightarrow (25, 18)$

ونفرض $x = 5 + t(25 - 5)$
 $= 5 + 20t$

$y = 10 + t(18 - 10)$
 $= 10 + 8t$

(t)

vid 7

[3] Digital differential Analyzer DDA

number of steps = $\max \begin{cases} x_2 - x_1 \\ y_2 - y_1 \end{cases}$

$x_{inc} = \frac{\Delta x}{\text{num of steps}}$

$y_{inc} = \frac{\Delta y}{\text{num of steps}}$

و نقل
نقل

نقل	نقل	نقل	نقل
x	R(x)	y	R(y)

ex) (10, 14) → (20, 18)

$$n.o.s = \begin{cases} x_2 - x_1 = 20 - 10 = 10 \\ y_2 - y_1 = 18 - 14 = 4 \end{cases} \quad \checkmark$$

$$x_{inc} = \frac{10}{10} = 1 \quad y_{inc} = \frac{4}{10} = 0.4$$

1	x	R(x)	y	R(y)
0	10	10	14	14
	11	11	14.4	14
	12	12	14.8	15
	13	13	15.2	15
	14	14	15.6	16
	15	15	16	16
	16	16	16.4	16
	17	17	16.8	17
	18	18	17.2	17
	19	19	17.6	18
	20	20	18	18