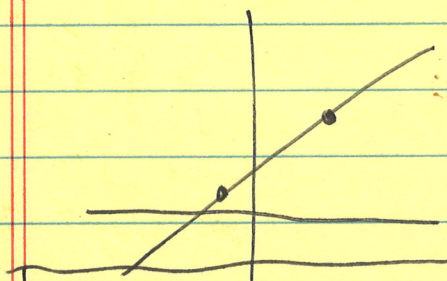
Lecture 9/11/23 : Linear Functions

HW due
Monday HW10
Wend HW11
Fri HW12
Sund HW13

Exam 1 Next Tuesday
Quiz 3 on Friday

Defn: A linear function is a function that has a constant rate of change.



No matter what two points we pick, we get same slope!

Important: $f(x) = mx + b$ — m = slope, b = y-coord of y-int } Point-Slope-Intercept form

Reminder.

x-int is the point where we cross the x-axis! Set $y=0$ solve for x

y-int is the point where we cross the y-axis! Set $x=0$ solve for y.

Tables:

Ex:

x	0	100	200	300
f(x)	325	650	975	1300

325/100 ↑ 325/100 ↑ 325/100

Linear

slope $= \frac{325}{100}$

y-int $= (0, 325)$

$y = \frac{325}{100}x + 325$

b)

x	0	5	8	15
y	130	260	338	520

linear slope = 26

y-int (0, 130)

$y = 26x + 130$

$\frac{130}{5}$, $\frac{78}{3}$, $\frac{182}{7}$

11 11 11

26 26 26

c)

x	0	12	24	36
f(x)	260	520	650	715

$\frac{260}{12} \neq \frac{130}{12} \neq \frac{65}{12}$

Not linear

As soon as not equal this is not linear.

#5 p. 66

a) $R(x) = 20x$ $\quad C(x) = 100 + 7.50x$

b) $P(x) = 20x - (100 + 7.50x) = 12.50x - 100$

c) slope = 12.50 make 11.50 dollars/shirt

y-int = $(0, -100)$ he has -100 at the beginning of a game day

x-int = $(\frac{100}{12.5}, 0)$ Break even point.

$\frac{100}{12.5}$ = (8, 0)

d) $50 = 12.5x - 100$

$150 = 12.5x$

$x = 12$

12 shirts