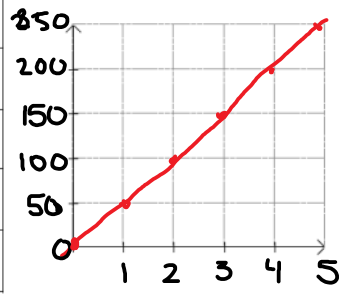
9.2 Notes: Patterns in a Table of Values

Alvin is cooking a turkey in a very old oven, and needs to heat the turkey to an internal temperature of 250 degrees. For absolutely no reason at all, he decides to make a table of values comparing how long it takes to reach different temperatures:

X represents the amount of time in ~~minutes~~ hours
Y represents the temperature in degrees

X	Y
0	0
1	50
2	100
3	150
4	200

Graph the ordered pairs:



Does this represent a linear relationship? yes

Temperature vs Time for cooking a Turkey

What is the relationship between X and Y?

The relationship can be represented in 3 ways:

1. Words: every time TIME goes up by 1 hour, the temperature goes up by 50°
2. Ordered Pairs (2,100) or (1,50)
3. Algebraic Expression or equation 50x = y or y = 50x

A variable is: Letters that represent a # that can change or vary

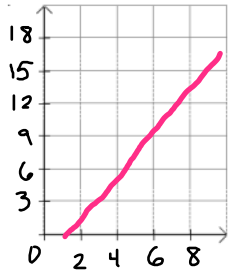
An expression is: Another # represented by math steps that may involve a variable eg 50x

How can you tell if a table represents a linear relationship?

B is not a linear relationship.

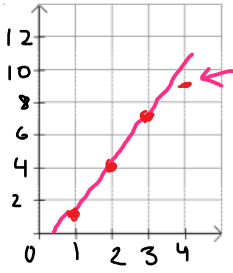
Relationship A

X	2	4	6	8
Y	1	5	9	13



Relationship B

X	1	2	3	4
Y	1	4	7	9



(4,9) ← not in line

Is there a way to tell if a table represents a linear relationship WITHOUT graphing? yes! pattern!

Think about how you can describe the relationship in words:

Every time x increases by ___, then y increases by ___

You can tell if a table represents a linear relationship by:

increases by ____

You can tell if a table represents a linear relationship by:
seeing if x always increases by same # and y always increases by the same #

Problem:
Wendy is buying shirts. The company charges $60 for the first shirt, and $15 for each extra shirt. Complete the table:

# of shirts	1	2	3	4
Cost	60	75	90	105

+15

x always increases by 1

Is this a linear relationship? How do you know?
It is because every time x increases by 1, y increases by 15

How much should 12 shirts cost? 11 increases of 1

shirt 1 → 12

costs 60 → 225

11 increases of 15

15×11 + 60 =
165 + 60 =

Formula: $C = 15(n-1)+60$

Does this represent a linear relationship?

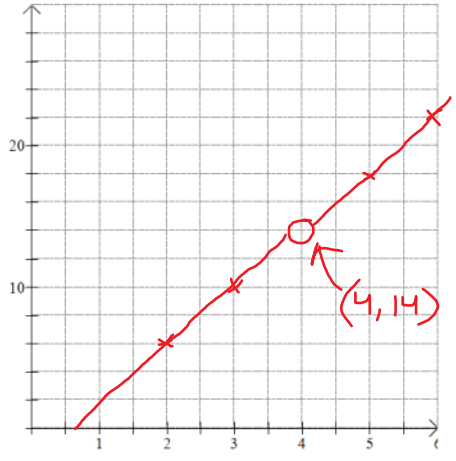
X	2	3	5	6
Y	6	10	18	22

+1 +2 +1

+4 +8 +4

What happens if you try to plot it on a graph?

still shows a linear relationship



There is a consistent pattern, but ...