Curriculum Outcomes:

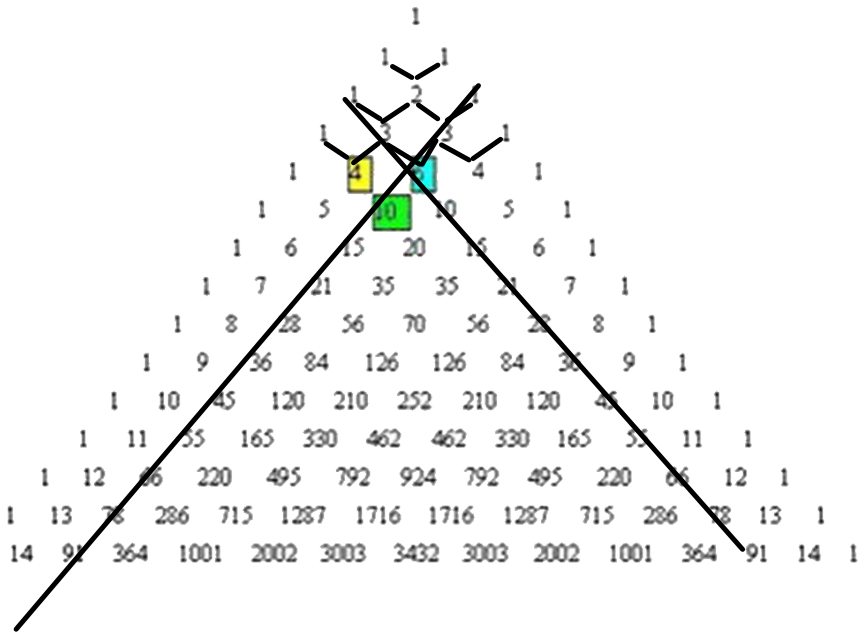
(PR1) Generalize a pattern arising from a problem-solving context using linear equations and verify by substitution.

(PR2) Graph linear relations, analyze the graph and interpolate or extrapolate to solve problems.

Student Friendly: Being able to identify a linear pattern in a t-table.

Section 4.1

Writing Equations to Describe Patterns



Pascal's Triangle

Look at each figure is there a pattern?

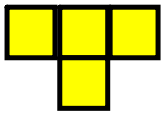


Figure 1

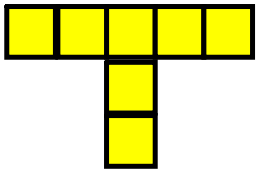


Figure 2

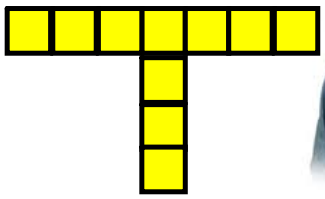


Figure 3

x | y

F | B

Figure #	# of Blocks
1 (3)	4
2 (3)	7
3 (3)	10
4	13
5	16
6	19

+1 ( ) +3

+1 ( ) +3

+ ( ) +3

See next slide if you need more help seeing the pattern

$B = 3f + 1$

100

Let's look at it again.

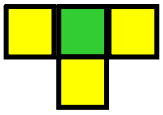


Figure 1

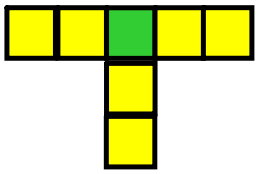


Figure 2

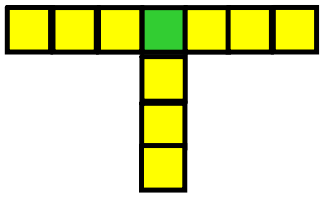


Figure 3

THUS

Figure #	# of Blocks
___	_____
___	_____
___	_____
	_____
	_____

Write an equation that relates the number of blocks, n, to the figure number, f.

(Common difference) x Figure + #

Is there a pattern?

F Figure #	C # Circles
1 (2)	1
2 (2)	3
3 (2)	5
4 (2)	7
5	9
6	11
7	13

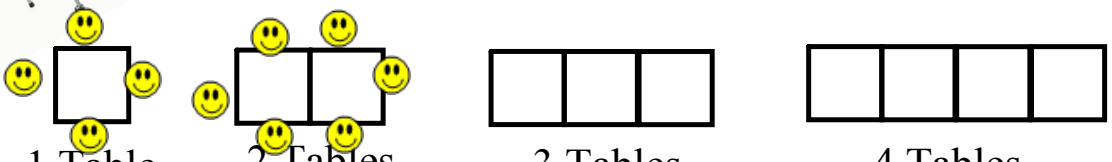
+1 ( ) +2

Write an equation that relates the number of circles, c, to the figure number, f.

$$C = \frac{2}{1}f - 1$$

How many people can sit at the tables?
(only one person per edge)

Table Seating



t # of tables	P #of people
1	4
2	6
3	8
4	10
5	12
6	14
t	

+1 (2) +2

$P = 2t + 2$

UNIT 4: VOCABULARY

1. _____: Expressions and equations used to represent relations have what is called a "_____". Its value NEVER changes.

T- Tables

or

Input/Output tables

x	y
1	3
2	8
3	13
4	18
5	23
6	28
⋮	
50	

+1 (5) → +5

Write an equation for the relationship

$y = \frac{\Delta y}{\Delta x} x \pm \#$

$y = \frac{5}{1} x - 2$

Write an expression for the relationship

$5x - 2$

$y = 5x - 2$

$y = 5(50) - 2$

$y = 250 - 2$

$y = 248$

T- Tables or Input/Output tables

x	y
1	-3
2	-7
3	-11
4	-15
5	-19
6	-23
.	
.	
.	
100	

Write an equations

$y = -4x + 1$

Write an expression for the relationship

$-4x + 1$

$y = -4x + 1$

$y = -4(100) + 1$

$y = -400 + 1$

$y = -399$

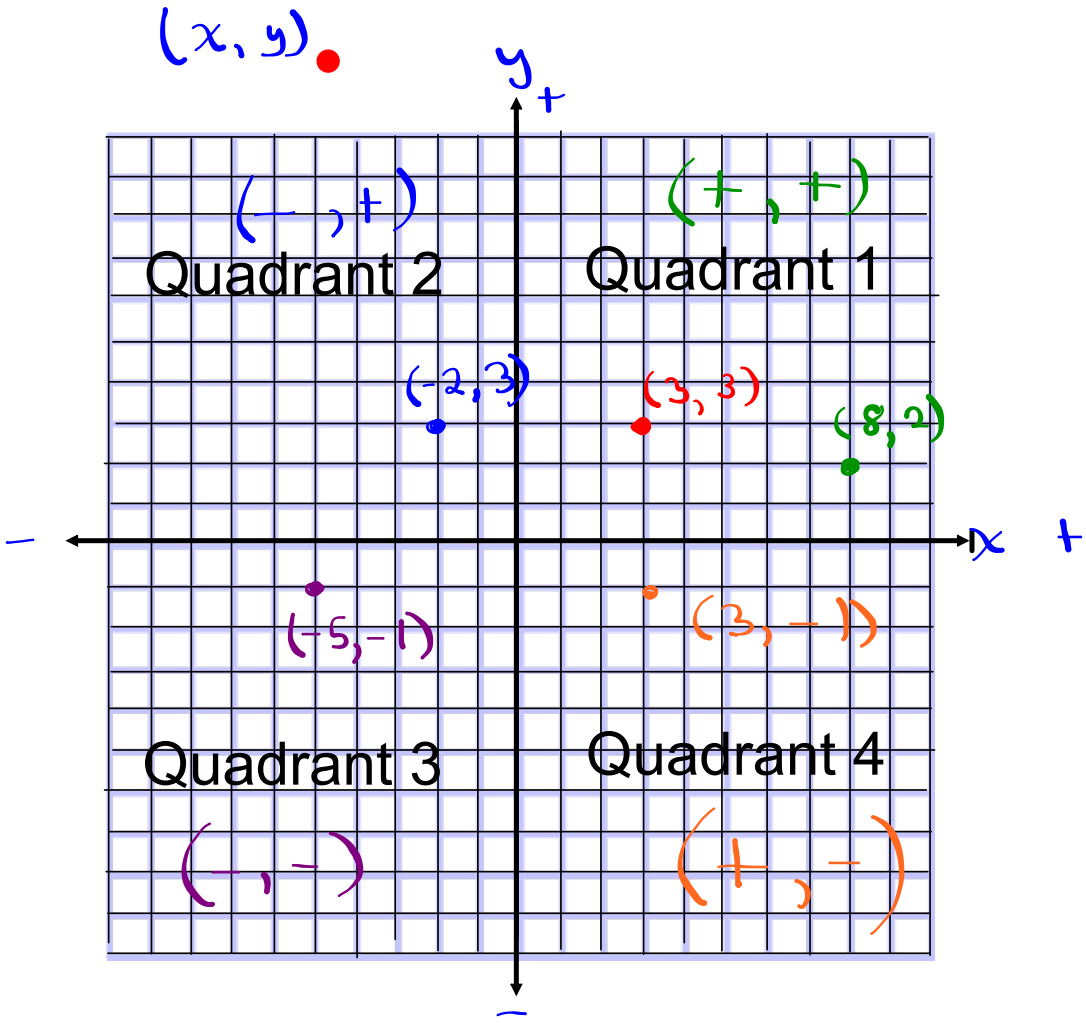
Equation

$$y = \left(\frac{\text{Change } y}{\text{Change } \times}\right)(\text{"x"}) \pm \#$$

X → independent

y→ dependent

Recall


(x, y)
y
+
(−, +)
(+, +)
Quadrant 2
Quadrant 1
(-2, 3)
(3, 3)
(8, 2)
−
x
+
(-5, -1)
(3, −1)
Quadrant 3
Quadrant 4
(−, −)
(+, −)
−