Warm Up Grade 9

Given the following t-table
i) Complete the table
ii) Describe a the pattern
iii) Write the equations and Expression
iv) Use your equation to determine how many circles would be in figure 500.

Figure # (x)	# Circles (y)
1	7
2	12
3	17
4	22
5	27
6	32
⋮	
500	

Pattern

+1 (5))+5
+1 (5))+5
+1 (5))+5
+1 (5))+5
+1 (5))+5

Equations

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

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

Expression

$5x + 2$

$y = 5x + 2$

$y = 5(500) + 2$

$y = 2500 + 2$

$y = 2502$

Try these

For n = 2 solve for each of the following

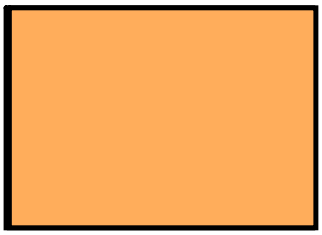
1) P = 5n +6

P=5(2) +6

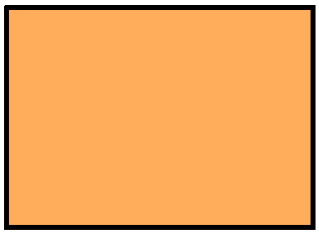
p= 10+6

p= 16

2) K = 4n-1



3) W= 10n - 5



For n = -5, solve for each of the following

1) P = 5n +6

2) K = 4n-1

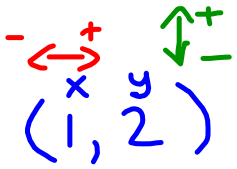
K=4(-5)-1

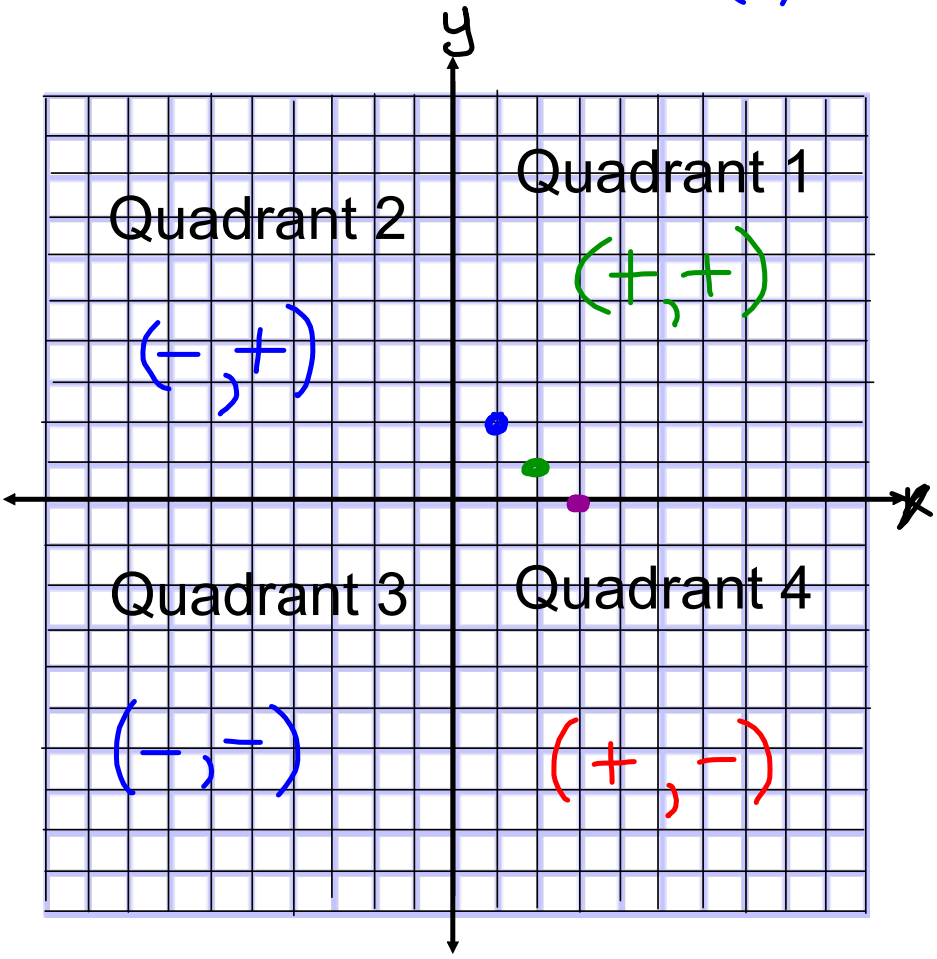
K=-20-1

K=-21

3) W= 10n - 5

Recall





x	y
1	2
2	1
3	0
4	−1
5	−2

Page 159

Questions 4 to 9

4. In each equation, determine the value of P when $n = 1$.

a) $P = 2n$ b) $P = 3n$ c) $P = 4n$ d) $P = 5n$

a) P= 2n

P = 2(1)

P= 2

b) P= 3n

P = 3(1)

P= 3

c) P= 4n

P = 4(1)

P= 4

d) P= 5n

P = 5(1)

P= 5

5. In each equation, determine the value of A when $n = 2$.

a) $A = 3n + 1$ b) $A = 3n + 2$

c) $A = 3n + 3$ d) $A = 3n + 4$

a) A= 3n + 1

A = 3(2) + 1

A = 6 + 1

A = 7

b) A= 3n + 2

A = 3(2) + 2

A = 6 + 2

A = 8

c) A= 3n + 3

A = 3(2) + 3

A = 6 + 3

A = 9

d) A= 3n + 4

A = 3(2) + 4

A = 6 + 4

A = 10

6. In a table of values for a pattern, $P = 3$ when $n = 1$; which of the following equations might represent the pattern?

a) $P = 3n$ b) $P = n + 3$

c) $P = 2n + 1$ d) $P = 3 - n$

a) P= 3n

P = 3(1)

P = 3

Works

b) P= n + 3

P = (1) + 3

P = 4

Doesn't Work

c) P= 2n + 1

P = 2(1) + 1

P = 2 + 1

P = 3

Works

d) P= 3 - n

P = 3 - 1

P = 2

Doesn't Work

7. The pattern in this table continues. Which expression below represents the number of squares in terms of the figure number?

Figure, f	Number of Squares, s
1	6
2	7
3	8
4	9
5	10

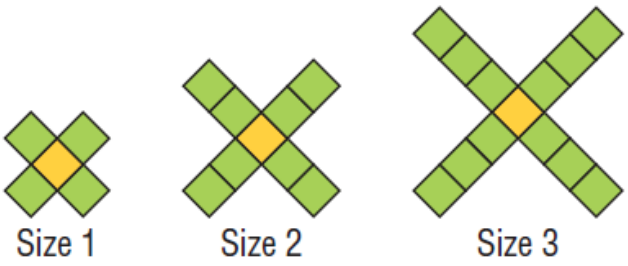
$y = \frac{\Delta y}{\Delta x} x \pm \#$

$S = \frac{\Delta S}{\Delta f} f \pm \#$

$S = \frac{1}{1} f + 5$

a) $5f$ b) $2f$ c) $f + 5$ d) $s + 5$

8. This pattern of squares continues. Which equation below relates the number of squares, n, in a picture to the size number, s?



a) $n = s + 4$

b) $n = 4s$

c) $n = 4s + 1$

d) $s = 4n$

x size (s)	y # of squares , (n)
1	5
2	9
3	13
4	17

+1 → +4; +1 → +4; +1 → +4

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

$n = \frac{\Delta n}{\Delta s}s \pm \#$

$n = \frac{4}{1}s + 1$

9. The pattern in this table continues. Which equation below relates the number of squares to the figure number?

Figure, f	Number of Squares, s
1	5
2	7
3	9
4	11
5	13

a) $s = 4f + 1$ b) $s = 2f + 3$

c) $s = f + 2$ d) $f = 2s + 3$

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

$S = \frac{\Delta S}{\Delta f} \cdot f \pm \#$

$S = \frac{2}{1} f + 3$

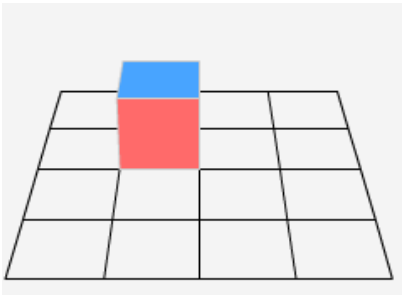
Equation

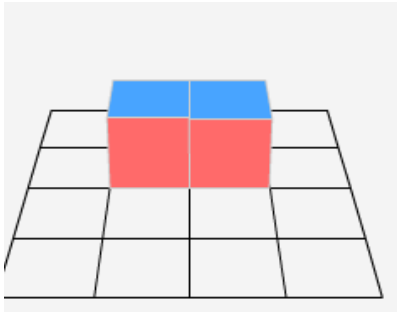
$$\text{Output} = \left(\frac{\text{change output}}{\text{change input}}\right)(\text{input}) \pm \#$$

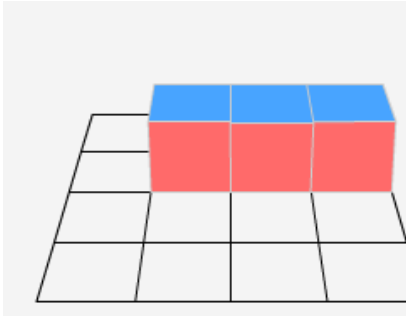
$$y = \frac{\Delta y}{\Delta x} x \pm \#$$

Remember Connecting Cubes

MIGHT BE TOO HARD
SO Might remove



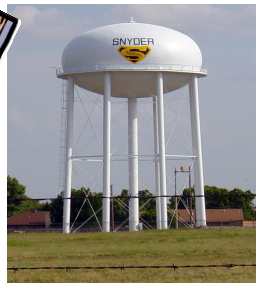




c # of cubes	f # of faces exposed
1 (4)	6
2 (4)	10
3	14
4	18
5	22
~~25~~	
100	

+4 +4 +4 +4

$f = \frac{4}{1}c + 2$



A large water tower holds 15000 liters of water, however during the winter the water tower was damaged and started to leak. This table shows the amount of water every hour after it sprung the leak. The level of water changes at a constant rate.

Time (t hours)	Amount (A Liters)
0	15 000
1	14 800
2	14 600
3	14 400
4	14 200

(-200) -200 -200 -200 -200

$A = -200t + 15000$

i) Write an ***expression*** for the amount in terms of the time since the water tower began to leak.

$-200t + 15000$

iii) How much water is in the water tower after 10 hours?

$A = -200t + 15000$

$A = -200(10) + 15000$

$A = -2000 + 15000$

$A = 13000$

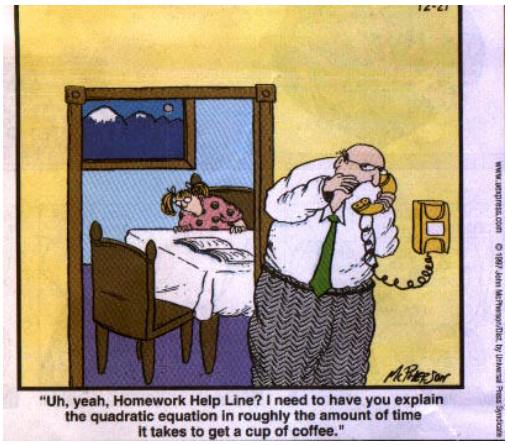
iv) When will the water tower be empty?

$A = -200t + 15000$

$0 = -200t + 15000$ (-15000 -15000)

$\frac{-15000}{-200} = \frac{-200t}{-200}$

$75 = t$



A Math tutor charges $15.75 for each hour and a fixed cost of $8.00.

i) Write an equation that relates the cost to the hours hired

ii) How much will a tutor cost for 4 hours?

Class/Homework

Page 160 - 162

Must Show ALL WORK

11, 12, 14, 15, 16,