HW SOL 4.1

September 30, 2020   9:05 AM

Name: **Key**   Date:_____

Math 9 HW Section 4.1 Writing Equations to Describe Patterns:

1. Given each sentence, write an equation that best describes the relationship between the two variables:

a) The sum of two numbers is 25	B) The difference of two numbers is 10	c) The product of three numbers is 30
$x + y = 25$	$x - y = 10 \begin{cases} y = x + 10 \end{cases}$	multiply $a \times b \times c = 30$
d) The quotient of two numbers is 5	e) "Y" is equal two times "x" plus four	f) "Cost" is equal to $10 per person plus $250
$\dfrac{x}{y} = 5$	$y = 2x + 4$	$C = 10 \times p + 250.$

2. Given each of the following table of values, find an equation that best describes the two variables:

a)
x	y
1	4
2	7
3	10
5	16

$3x + 1 = y$

b)
x	y
1	−5
2	−1
3	3
4	7

$4x - 9 = y$

c)
x	y
2	7
4	13
6	19
8	25

d)
x	y
6	1
10	−3
7	0
3	4

$y = -x + 7$

e)
x	y
5	10
9	18
1	2
4	8

f)
x	y
3	14
9	26
5	2
4	11

$3x - 1 = y$

$5x - 23 = 2y$

d)
x	y
4	6
6	4
9	1
3	7

e)
x	y
5	1
7	6
9	11
11	16

f)
x	y
12	1
6	2
4	3
2	6

$x \cdot y = 12$

3. Given each equation, complete the following table of values

a) $x + y = 5$

x	0	1	3	5
y	5	4	2	0

$x + y = 5$
$(1) + (4) = 5$

b) $y = 2x - 1$

x	0	0.5	2	4
y	−1	0	3	7

$y = 2x - 1$
$= 2(0) - 1$
$= -1$

$y = 2x - 1$
$y = 2x - 1$
$0 = 2x - 1$
$1 = 2x$
$0.5 = x$

$y = 2x - 1$
$y = 2(2) - 1$
$y = 3$

$y = 2x - 1$
$y = 2(4) - 1$
$y = 7$

1

c) $y = 3x - 1$

x	0	2	4	−1
y	−1	5	11	0

d) $y = \dfrac{3+x}{2}$

x	0	2	4	6
y	1.5	2.5	3.5	4.5

4. Given the figures below, derive a formula for the Number of sticks used (S) vs the Number of Triangles (T)

Figure 1   Figure 2   Figure 3

#△	STICKS
1	3
2	5
3	7
⋮	
85	?

$$S = 2T + 1$$

b) How many sticks will be needed for 85 triangles?

$$S = 2(85) + 1$$
$$= 161$$

c) If we continue the pattern, how many triangles can be created with 121 toothpicks?

$$121 = 2T + 1$$
$$60 = 2T$$
$$30 = T$$

5. Given the figures below, derive a formula for the number of small little squares (S) vs the figure number (N)
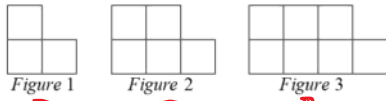

Figure 1   Figure 2   Figure 3
3   5   7

2F (FIG#)	SQUARES
(1) 2	3
(2) 4	5
(3) 6	7
8	9
10	11

b) How many squares little squares will there be in the figure 100?

$$S = 201$$

$$S = 2 \times F + 1$$
$$S = 2 \times 100 + 1$$
$$S = 201$$

$$121 = 2F + 1$$
$$120 = 2F$$
$$60 = F$$

c) If we continue the pattern, which figure will have 121 little squares?

$$FIG : 60$$

6. Given the following figures, derive a formula for the number of little squares (S) vs the figure number (N)

Size 1   Size 2   Size 3

SIZE	BOX
1	5
2	9
3	13
4	17
5	21

b) Which figure will have 325 little boxes?

$$S = 4B + 1$$

$$B = 4 \times S + 1$$

$$325 = 4 \times S + 1$$
$$324 = 4S$$
$$81 = S$$