

Name: _____

Date: _____

Math 8/9H Section 7.1 Linear Relations and T.O.V.

1. Complete the following table of values with the given equation:

i) $2x - 3y = 6$

x	y
6	
	0
-2	
	-4

ii) $y = \frac{5-3x}{2}$

x	y
5	
	8
3	
	-8

iii) $7x = -6y + 3$

x	y
-6	
	-10
-3	
	18

iv) $6x + y - 1 = 0$

x	y
6	
	25
-12	
	24

2. Indicate whether if the following will be a linear relationship or not. Explain your answer.

a) Jack makes 5 dollars a day. In 6 days, he will earn \$30.

Earnings vs Number of Days:

b) 3 muffins cost \$2.00. 6 muffins cost \$4.00. Cost vs # of Muffins

c) Tom deposits \$1 in the bank on the first day. The next day he deposits \$2, then \$4, \$8... and so on. He doubles the amount deposited each day.

Amount Deposit vs # of Days

d) A taxi driver charges you \$5.00 for the first minute and then \$1.25 for every minute afterwards. Cost vs Time:

e) A teacher gives his first student 1 point, second student 1 point, and third student 2 points. Each successive student afterwards will receive the amount equal to the sum of the previous two students. # of Points vs # of Students.

f) On Jim's first birthday, his aunt gave him \$4 as a gift. On his 5th birthday, his aunt gave him \$16. On his 7th birthday his aunt gave him \$22. Each birthday that he sees his aunt, she gives him an amount equal to his age times three plus one. Birthday Money amount vs Age

3. Given that each of the following table of values represents a linear relationship, derive an equation that satisfies all the pairs of values.

a)

x	y
-5	-19
-1	-7
3	5
5	11

b)

x	y
-1	4.5
3	-5.5
4	-8
10	-23

c)

x	y
-7	-3
-17	-6
3	0
13	3

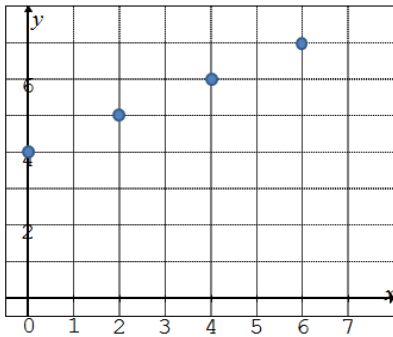
d)

x	y
9	-30
11	-37
3	-9
0	1.5

4. Complete the following table of values with the given graph:

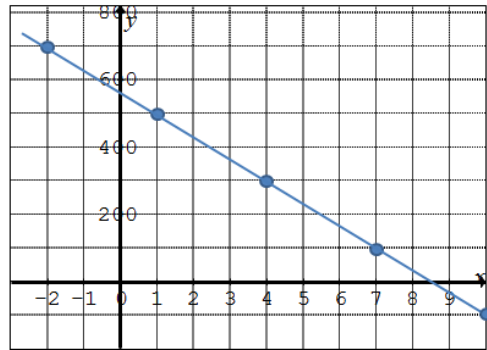
a)

x	0	2	5	22
y				



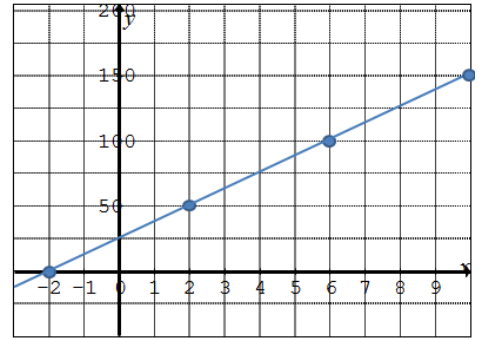
b)

x	0		5	
y		300		600



c)

x	0		7	
y		75		500



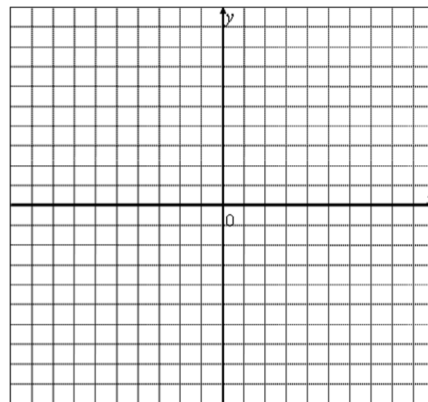
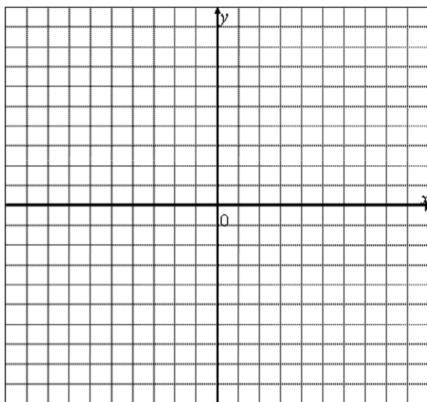
5. Make a table of values with the equation and then graph it on the grid provided

a) $2y = 3x - 6$

b) $2x + 6y = -12$

x				
y				

x				
y				



6. Terry makes \$2500 a month with a \$150 raise each month. Sarah makes a fixed monthly salary of \$5600. In how many months will it take Tom to earn the same monthly amount as Sarah?

b) How many months will it take Terry to make the same total amount as Sarah?

c) Whose job will you take if you were to work for 4.5 years?

7. John has \$6 in quarters and dimes. Name all the combinations of quarters and dimes that are possible. Is the relationship between the number of quarters and dimes a linear relationship? Explain? Graph the relationship if necessary.

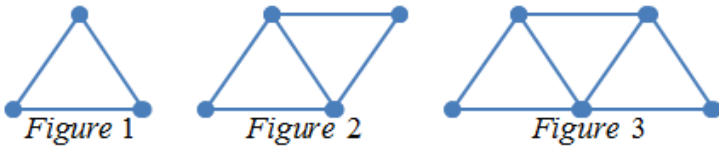
8. The following table provides the relationship between the temperatures in Fahrenheit (F) vs Celsius (C). Use the information provided to derive an equation between (F) and (C)

<i>Fahrenheit</i>	41	50	23	131
<i>Celsius</i>	5	10	-5	55

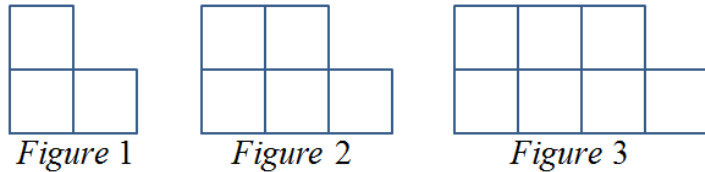
9. The points (x,y) represented in this table of values lie on a straight line. When the equation of this line is written in the form of $y = Ax + B$, what is the value of $A+B$?

x	y
1	12
$t-2$	v
t	$v+6$

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



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



b) Is it possible to derive a formula for the total number of possible squares (T) vs the figure number (N)? Is this a linear relationship?

12. In the series of odd numbers $1 + 3 + 5 - 7 - 9 - 11 + 13 + 15 + 17 - 19 - 21 - 23 \dots$ the signs alternate every three terms as shown. What is the sum of the first 300 terms of the series?

13. An arithmetic sequence is a sequence in which each term after the first is obtained from the previous term by adding a constant. For example, the sequence 2, 11, 20, 29, ... is an arithmetic sequence.

a) Find the 11th term in the arithmetic sequence 17, 22, 27, 32.....

b) Explain why there is no number which occurs in both of the following arithmetic sequences.

17, 22, 27, 32,.....

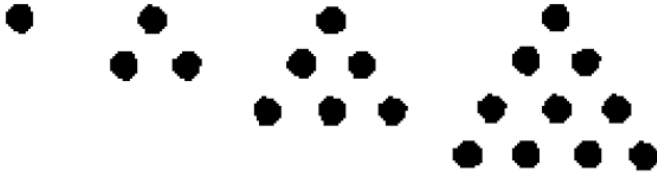
13, 28, 43, 58,

c) Find a number between 400 and 420 which occurs in both of the following arithmetic sequences:

17, 22, 27, 32,.....

14, 21, 35, 42,

14. Triangular numbers can be calculated by counting dots in the following triangular shapes.



a) The first triangular number is 1, the second is 3, the third is 6, the fourth is 10, and the n th triangular number is equal to $1 + 2 + 3 + 4 + \dots + (n - 1) + n$. Calculate the 10th and 24th triangular numbers.

b) Prove that the sum of any three consecutive triangular numbers is always 1 more than three the middle of these three triangular numbers.

c) The 3rd, 6th, and 8th triangular numbers (6, 21, and 36) are said to be in arithmetic sequence because the second minus the first equals the third minus the second. (The differences are equal). Also, the 8th, 12th, and 15th, triangular numbers (36, 78, and 120) are in arithmetic sequence. Find the other triangular numbers, each larger than 2004, which are in arithmetic sequence.