Lesson 1.0

Friday, February 3, 2017 5:41 PM

*Linear Relation means x+y-values must increase/decrease by a constant amount.

Chapter 1 Prerequisite Skills

1. Determine whether each relation is linear or non-linear. Justify each answer.

a) (1, 3), (3, 6), (5, 10), (6, 13)

+3 +4 +3
+2 +2 +1
not constant

∴ Not Linear

b) $y = 2x + 7$

x	y	
0	7	
1	9	+2
2	11	+2
3	13	+2

+1 +1 +1 constant

∴ Linear

2. Paul writes the following number pattern: 5, 13, 21, …

a) Create a table of values for the first five terms.

Term	Value
1	5
2	13
3	21
4	29
5	37

b) Develop an equation that can be used to determine the value of each term in the number pattern.

Value = 8(Term #) − 3

$y = 8x - 3$

c) Which term has a value of 133?

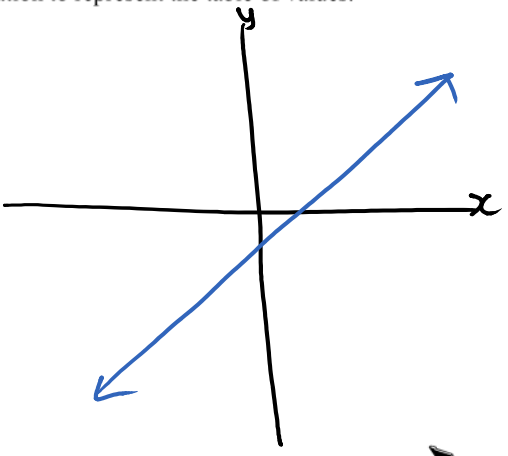
$133 = 8x - 3$

$17 = x$

133 is the 17th term.

3. Create a graph and a linear equation to represent the table of values.

x	y
−6	−15
−4	−11
−2	−7
0	−3
2	1
4	5
6	9



$y = 2x - 3$

y-int

slope

Slope Intercept: $y = mx + b$ (m: slope, b: y-int)

Slope $= \frac{\text{rise}}{\text{run}}$

4. Express each equation in slope-intercept form.

a) $3x - y = 6$

$+y \quad +y$

$3x = 6 + y$

$-6 \quad -6$

$3x - 6 = y$

$y = 3x - 6$

b) $-5x + 2y + 7 = 0$

$2y = 5x - 7$

$y = \frac{5}{2}x - \frac{7}{2}$

5. Evaluate.

a) $\sqrt[3]{27}$ $\quad (3 \times 3 \times 3 = 27)$

$\therefore \sqrt[3]{27} = 3$

b) $\sqrt[4]{-\frac{16}{625}}$ $\quad \frac{\sqrt[4]{-16}}{\sqrt[4]{625}} = \frac{\sqrt[4]{-16}}{5}$

Cannot take the "even" root of a negative number.

6. Simplify each expression by rewriting it using positive exponents only.

a) $\frac{5^2}{5^7}$ $\quad = 5^{2-7} = 5^{-5} = \frac{1}{5^5}$

b) $[(x^{-2}y)^4]^{-3}$ $\quad = (x^{-2\times4}\, y^{1\times4})^{-3}$

$= (x^{-8} y^4)^{-3}$

$= x^{-8\times-3}\, y^{4\times-3}$

$= x^{24} y^{-12} = \frac{x^{24}}{y^{12}}$

7. A mysterious substance has a half-life of 5 minutes. Suppose you have a sample of this substance with a mass of 700 g. Your teacher gives you the formula for the mass of the mysterious substance remaining after n 5-min intervals is $A = 700\left(\frac{1}{5}\right)^n$.

a) Create a table of values showing the amount of your substance remaining after the first four 5-min intervals.

# 5-min int.	Amount Remaining
1	140
2	28
3	5.6
4	1.12

b) How long would it take for the sample to be reduced to $\frac{1}{125}$ th its original size?

$\frac{1}{125}$ th of 700 = 5.6

This happens at the 3rd 5 minute interval which means it takes the sample 15 minutes to be reduced to $\frac{1}{125}$ th its original size.