Topics

- Arithmetic Sequences
  - Explicit and Recursive Formulas
- Direct Variation
- Inequalities in 2 variables
- Scatter/Correlation
  - By hand and in calculator
- Interpolation/Extrapolation
- Residuals by hand
- Word Problems

Sequences:

Find the 27th term of the sequence:

$$-4, -7, -10, \ldots$$

Given that $a_{17} = 101 \; and \; a_{24} = 150.$ Find the first term:

Find the missing terms:

63, ___, ____, ____, ____, 148

Write the explicit formula for:

$$10, \quad 6, \quad 2, \ldots$$

Find the 83rd term:

Find which term is -274

Recursive:

Write the first 4 terms for the following:	Find the Recursive formula for the following sequence
$\begin{cases} a_1 = 1 \\ a_n = 5 \cdot a_{n-1} - 10 \end{cases}$	$10, 3, -4, -11 \ldots$

Residuals:

The following data is modeled by the linear regression equation: $y = 1.1x + 9.3$. Find all the predicted values of y. Then find all the residuals.

x	y	Predicted	Residuals
1	10		
2	13		
3	12		
4	12		
5	16		

1. The table gives the life expectancy of a child born in the United States in a given year.

a. Enter the data into the calculator. **Use years since 1920 as the independent variable**

b. Describe the correlation of the scatterplot.

c. Find the linear regression Equation

d. What is the r-value? What does the r-value indicate?

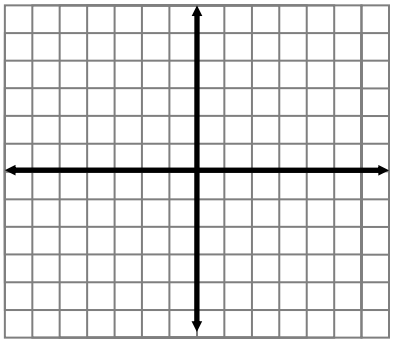
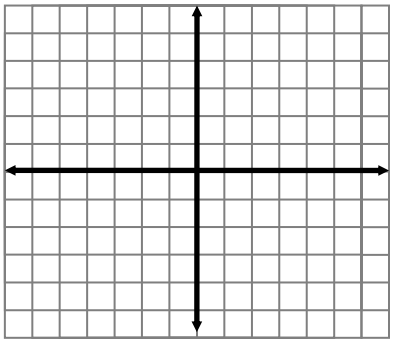
Years of Life Expected at Birth	
Year of Birth	**Life Expectancy (years)**
1920	54.1
1930	59.7
1940	62.9
1950	68.2
1960	69.7
1970	70.8
1980	73.7
1985	74.7
1990	75.4
1995	75.8

e. Use the data to predict the life expectancy of a baby born in 2016. Explain how you determined your answer (interpolation or extrapolation). Is your answer reasonable in context?

f. **Sketch** the residual plot. Does is imply that a linear model is appropriate?

Word: Ann is twice as old as Bill. The sum of their ages is 48 fewer than 5 times Bill's age. How old be they?

Graph the following Inequalities

$y < -\frac{2}{3}x + 2$ Write one solution:	
$4x + y \geq 4$ Write one solution:	

Find the missing terms: _____, 71, _____, _____, -22 , _____

Write a formula for this sequence:

What is the 13th term?

Direct Variation:

1. Suppose y varies directly as x and y = 51 when x = 3.
    a. Write a direct variation equation that relates x and y.

    b. Find the value of x when y = 63

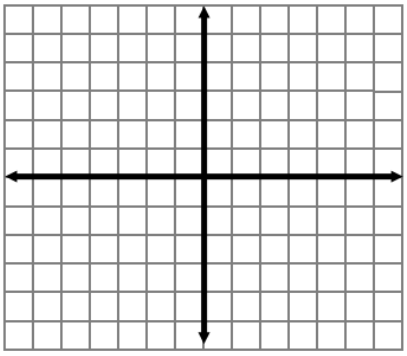
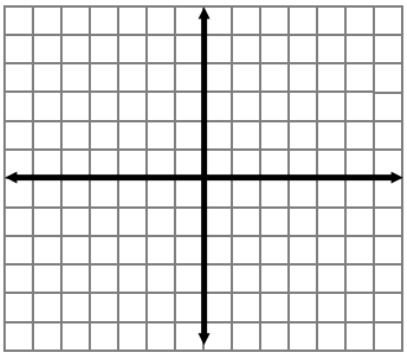
2. The distance a jet travels varies directly as the number of hours it flies. A jet traveled 3420 miles in 6 hours.
    a. Write the direct variation equation:

    b. How long will it take to fly 6500 miles.

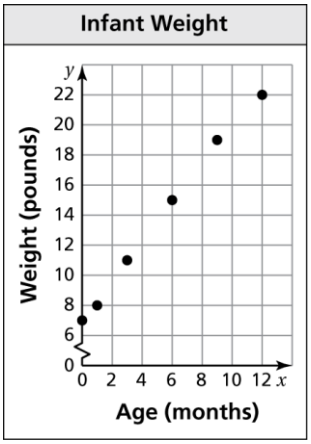
    c. How far will it go in 24 hours?

Find 5 consecutive integers such that their sum is 820.

Graph:

$x < 4$	$4 - 3y \leq 16$
	

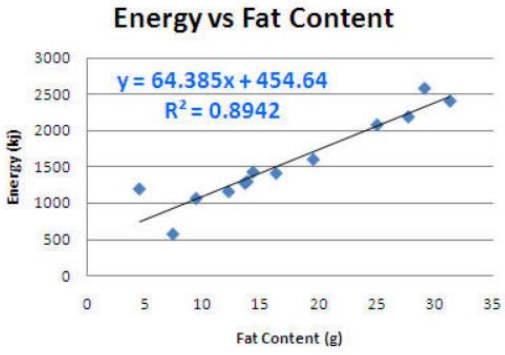
1) The scatter plot shows the weights *y* of an infant from birth through *x* months.



a) At what age did the infant weigh 11 pounds?
b) What was the infant's weight at birth?
c) Draw a line that you think best approximates the points.
d) Write an equation for your line.

e) Use the equation to predict the weight of the infant at 18 months.

f) Does the data show a *positive*, a *negative*, or *no* relationship?



a) Find the energy content of an item with a fat content of 23g. Is this interpolation or extrapolation?

b) Find the energy content of an item with a fat content of 0g. Is this interpolation or extrapolation?