VISUALIZATION BREAKOUT #1 INSTRUCTIONS

Below you will find three sets of quantities, Quantity 1: Statistical Data Set; Quantity 2: Pythagorean Theorem; Quantity 3: Fractions. Each set is represented in two ways, numerically and visually. As a group, you will discuss responses to the questions: *What does the quantity tell you? What sense can you make from this representation?* First, discuss the numeric representation of data followed by the visual representation. After you have finished discussing all three sets, respond to the question: *How did the representation influence your thinking about the data?*

REPRESENTATION SET 1: STATISTICAL DATA SET

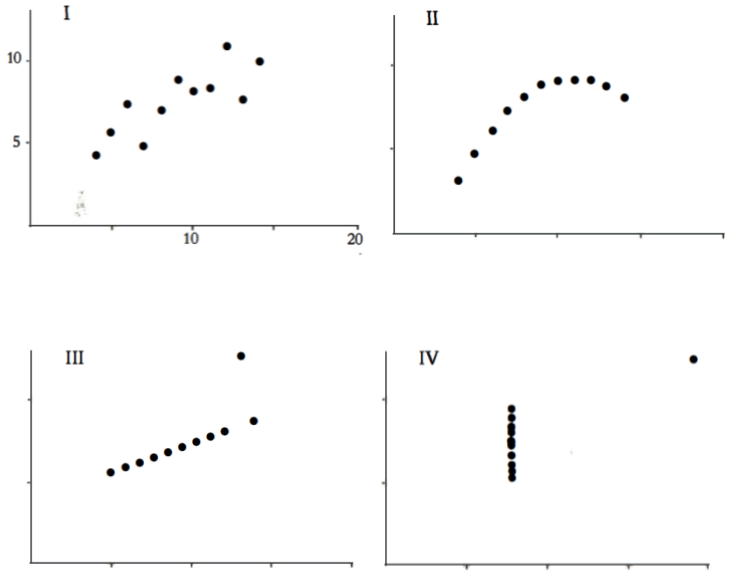
Below are four sets of 'x,y' values. Numeric Set I is the same data set as Visual Set I. Numeric Set II is the same data set as Visual Set II, and so on.

NUMERIC REPRESENTATION

I		II		III		IV	
X	Y	X	Y	X	Y	X	Y
10.0	8.04	10.0	9.14	10.0	7.46	8.0	6.58
8.0	6.95	8.0	8.14	8.0	6.77	8.0	5.76
13.0	7.58	13.0	8.74	13.0	12.74	8.0	7.71
9.0	8.81	9.0	8.77	9.0	7.11	8.0	8.84
11.0	8.33	11.0	9.26	11.0	7.81	8.0	8.47
14.0	9.96	14.0	8.10	14.0	8.84	8.0	7.04
6.0	7.24	6.0	6.13	6.0	6.08	8.0	5.25
4.0	4.26	4.0	3.10	4.0	5.39	19.0	12.50
12.0	10.84	12.0	9.13	12.0	8.15	8.0	5.56
7.0	4.82	7.0	7.26	7.0	6.42	8.0	7.91
5.0	5.68	5.0	4.74	5.0	5.73	8.0	6.89

N = 11
mean of X's = 9.0
mean of Y's = 7.5
equation of regression line: $Y = 3 + 0.5X$
standard error of estimate of slope = 0.118
t = 4.24
sum of squares $X - \overline{X} = 110.0$
regression sum of squares = 27.50
residual sum of squares of Y = 13.75
correlation coefficient = .82
$r^2 = .67$

VISUAL REPRESENTATION



REPRESENTATION SET 2: PYTHAGOREAN THEOREM

Below is one example of the Pythagorean Theorem. The visual may need some explanation. If someone in the group is familiar with the visual representation, please spend a few minutes explaining it to prime the conversation.

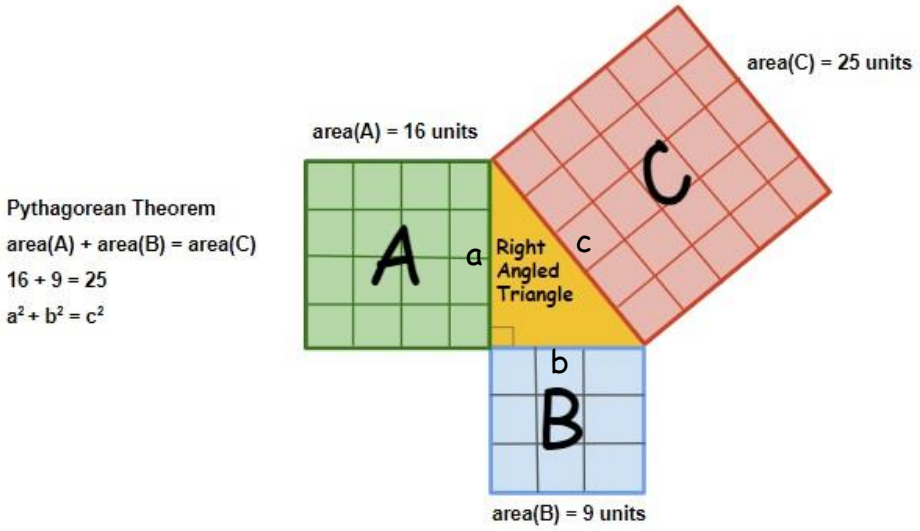
NUMERIC REPRESENTATION

$$a^2 + b^2 = c^2$$

$$4^2 + 3^2 = 5^2$$

$$16 + 9 = 25$$

VISUAL REPRESENTATION



REPRESENTATION SET 3: FRACTIONS

Below are two numeric representations of fraction addition and a visual representation of the relationships between fractions in a "fraction wall."

NUMERIC REPRESENTATION

$$\frac{1}{2} + \frac{1}{2} = 1$$

$$\frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{1}{2}$$

VISUAL REPRESENTATION