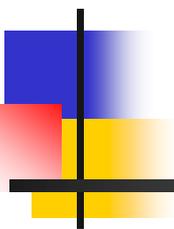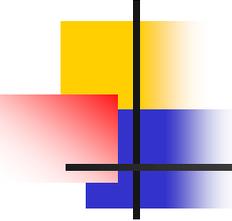# The next class: what skills are universities hoping that algebra students will learn?

Point Loma Nazarene University:

Ryan Botts, Catherine Crockett, Greg Crow,

Jesus Jimenez and Maria Zack

Point Loma Nazarene University

- 2700 traditional undergraduate students

- 450 adult degree completion students (programs in partnership with community colleges)

- 1100 graduate students

- Private liberal arts school

- All students must take a general education mathematics class that is <u>not</u> College Algebra
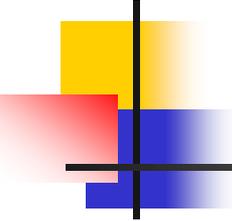
Focus for Today

- Students who leave Algebra and take Trigonometry/Pre-Calculus or Business Calculus are expected to have retained a fair amount of procedural knowledge.

- What about all of the other students?

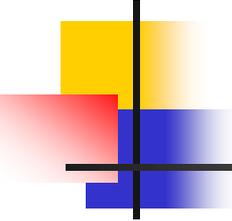- Examples and practice exercises (these are class exercises that we use)
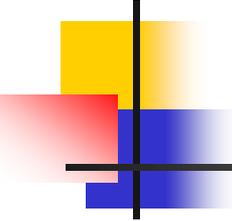
Question #1

How many handshakes are possible in this room?

- Find two partners
- 2 minutes: what do you need to know to work on this question?
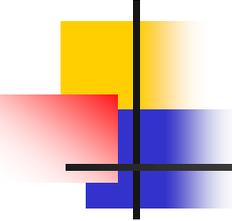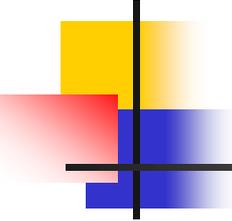
Solve

Now that you have your questions answered, solve the problem.

Discussion

- What is the solution?

- What ways can students arrive at this solution?

- What skills are necessary?

Question #2

Scatterplots: We gathered height and weight data from students in all sections of this class. Graph the height (in inches) & weight pairs in the table to the right with height on the x-axis and weight on the y-axis.

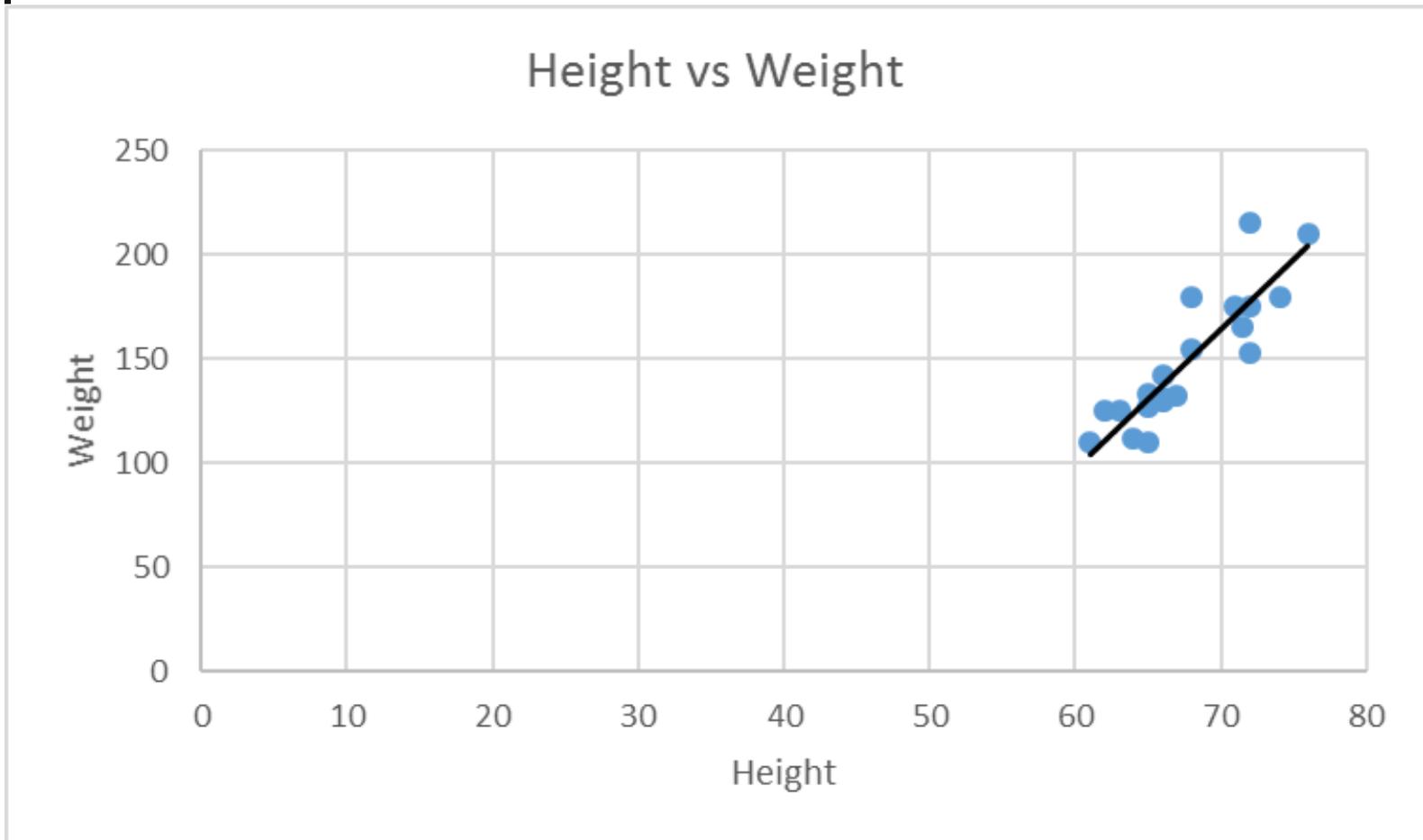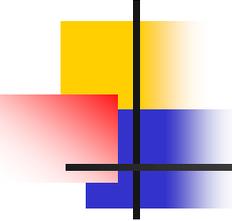| height	weight
76	210
67	132
66	142
72	175
74	180
66	131
71	175
71.5	165
72	215
65	127
63	125
64	112
68	180
65	110
72	153
62	125
65	133
66	130
61	110
68	155
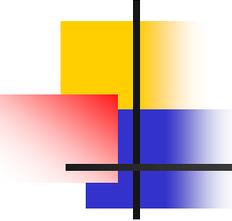
Add a Regression Line

Now add to your graph the regression line that best approximates the data. The equation for the line is
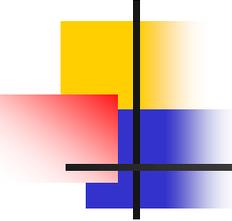
$$y = 6.64x - 300$$

Result

Height vs Weight

Discussion

- What skills do the students need?

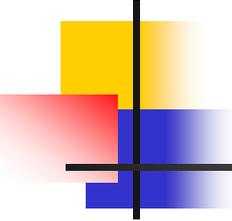- What challenges might they encounter?

Question #3

Definition: The <u>median</u> is the middle point of an ordered number set, in which half the numbers are above the median and half are below.

In groups: Find the median of each of the two sets:

(a) 15 12 10 11 16
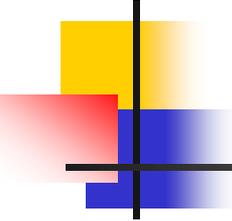
(b) 15 12 10 11 16 8

Answer

(a) 15 12 10 11 16
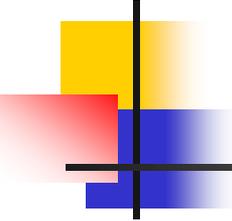
10 11 12 15 16

(b) 15 12 10 11 16 8

8 10 11 11.5 12 15 16
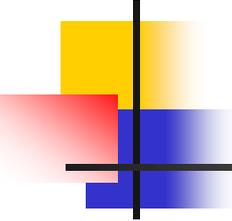
Discussion

- What skills do the students need?

Question #4

It is graduation day. You borrowed money for college and your loan balance is $8,000. You now need to start making payments. The interest rate on the loan is 6% and you have 10 years to pay the loan back.
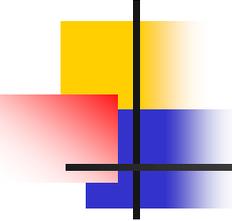
- Work in groups of three
- Find the equation for calculating your monthly loan payment (Google is your friend here)
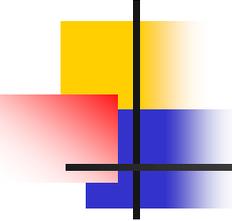- Find the loan payment amount

Answer

$88.82

Is this answer reasonable?

Discussion

- What skills do the students need?

Question #5 (extra credit)

Still in groups: Now that you have the value for the loan payment ($88.82), fill in the amortization table below. Remember that the monthly interest rate is 0.06/12 and each month you pay interest on the balance of the loan at the end of the previous month.

Payment Number	Payment Amount	Interest Amount	Principle Amount	Balance
				$ 8,000.00
1				
2				
3				
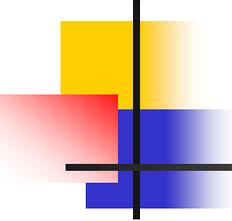
Table

Payment Number	Payment Amount	Interest Amount	Principle Amount	Balance
				$ 8,000.00
1	88.82	$ 40.00	$ 48.82	$ 7,951.18
2	88.82	$ 39.76	$ 49.06	$ 7,902.12
3	88.82	$ 39.51	$ 49.31	$ 7,852.81
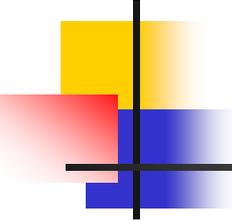
Summary Skills

- Clarifying questions
- Experimentation: willing to try methods and check results
- The basics: graphing a line, algebra
- Formulas (given the formula, can they use it)
- Reading
- Teamwork
- Excel (use of simple formulas)