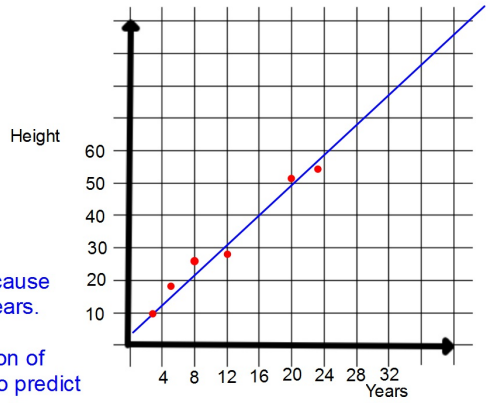
Algebra 1 Bellwork, Thursday, November 20, 2014

1. Make a scatter plot

Years after planting	Height (ft)
3	10
5	18
8	25
12	28
20	51
23	54



5. How would you find the height of a 100 year old tree?

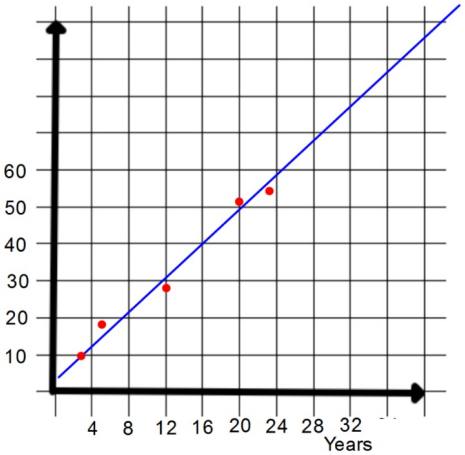
You couldn't use this graph because you can't extend it out to 100 years.

But if you could write an equation of the trend line you could use it to predict the height in 100 years.

Writing an equation for a trend line:

1. Pick two points on the trend line
2. Find the slope (rate of change)
3. Write the equation of the line

Find two good points on the line.



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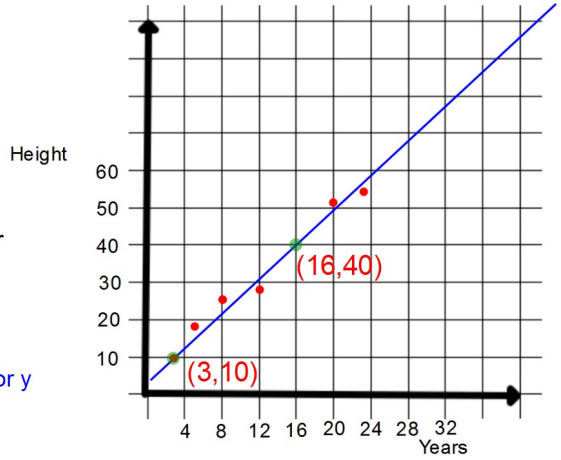


5. Find the height of a 100 year old tree.

EQ: $y - 10 = \frac{30}{13}(x - 3)$

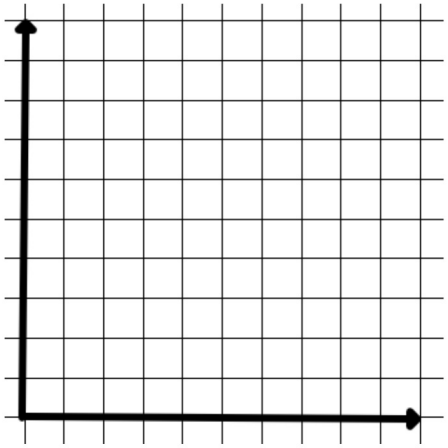
Now replace x with 100 and solve for y

y = 233.85 ft.

Make a scatter plot of this data and find the equation of the trendline.
Round to the nearest hundredth.

Length of a snake.

Age (yrs)	Length(cm)
1	15
3	21
4	28
9	52
11	75
12	83



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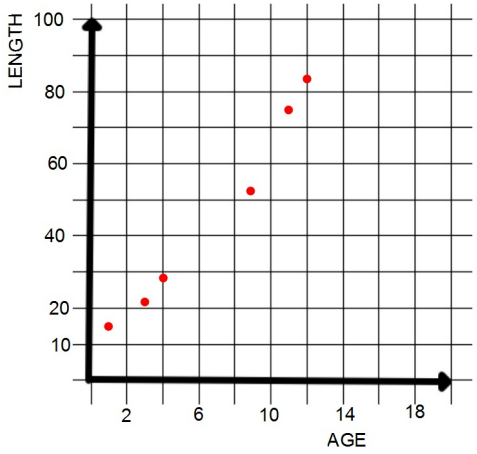

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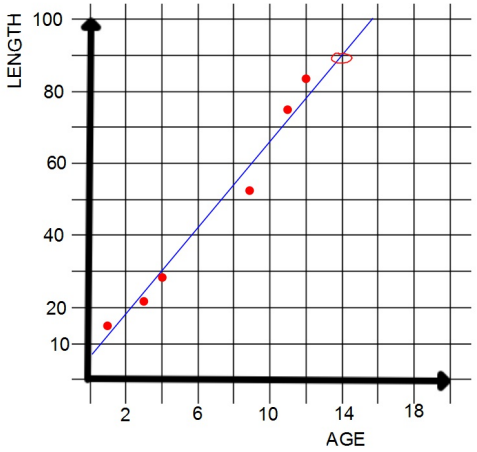
EQUATION:



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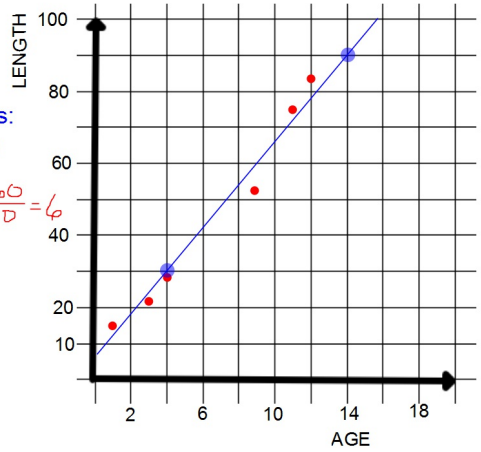
Using the two points:
(4, 30) and (14, 90)

$m = \frac{90-30}{14-4} = \frac{60}{10} = 6$

EQUATION:

$y - 30 = 6(x - 4)$
or
$y = 6x + 6$



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Use this equation to answer the following questions

$y = 6x + 6$

1. Predict the age of a snake that is 300cm long

$300 = 6x + 6$ $\quad x = 49$ years

2. Predict the length of a 30 year old snake.

$y = 6(30) + 6$ $\quad y = 186$ cm

Going back to the bellwork

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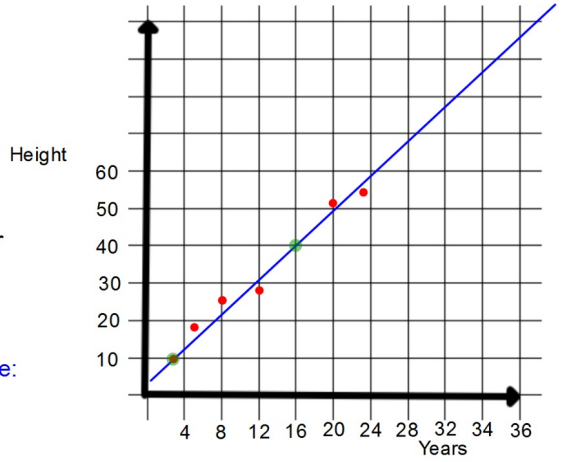

5. Find the height of a 100 year old tree.

EQ: $y - 10 = \frac{30}{13}(x - 3)$

In slope-intercept form this would be:
$y = 2.31x + 3.08$

Linear Regression: Finding the equation of the "line of best fit".

Using Technology to make a scatter plot
and find the equation of the trend line.

1. Graphing Calculator
2. Spreadsheet software
3. Online Regression software

x y

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1. Press STAT
2. EDIT
3. Enter x in L_1 and Y in L_2

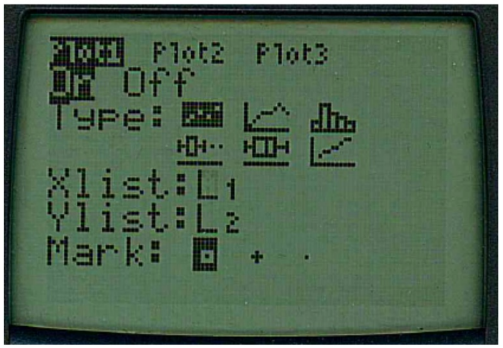
To make a scatter plot on the graphing calculator:

1. Press 2nd then Y=

2. Turn on a Scatter Plot

3. Make sure your screen looks like this →

4. Press Zoom then choose Option 9:



Have the calculator find the equation of the "line of best fit"

1. Press STAT
2. Arrow to the right once.CALC
3. Choose Option 4: LinReg(ax+b)
4. Since you put X in L_1 and Y in L_2 just press enter.

EQ: $y = 2.17x + 5.35$

This is what the calculator considers the best equation

How does this compare to the equation from the graph?

$y = 2.31x + 3.08$