Getting Ready for ...

Learning Goals

Scatter plots & Trends in Graphs


Leg Length (cm)

Tibia Length (cm)
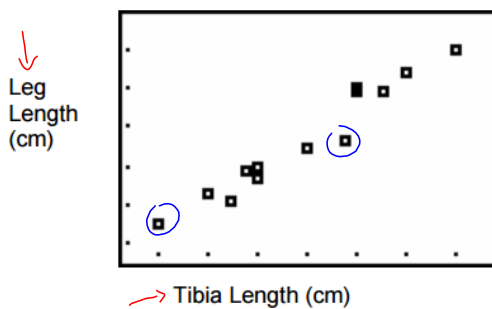
Some questions for you about the graph:

1-Do you think that as the length of the tibia increases,the length of the leg increases?

2-Do you think that if you know the length of a person's leg, that you would be able to predict the length of their tibia?

A *scatter plot* is a graph that shows the _relationship_ between **two** variables.

The points in a scatter plot often show a pattern, or _trend_ .

From the pattern or trend you can describe the _relationship_ .

Variables

Julie's Height vs. Age

Height (cm) — *dependent*

Age (years) — *independent*
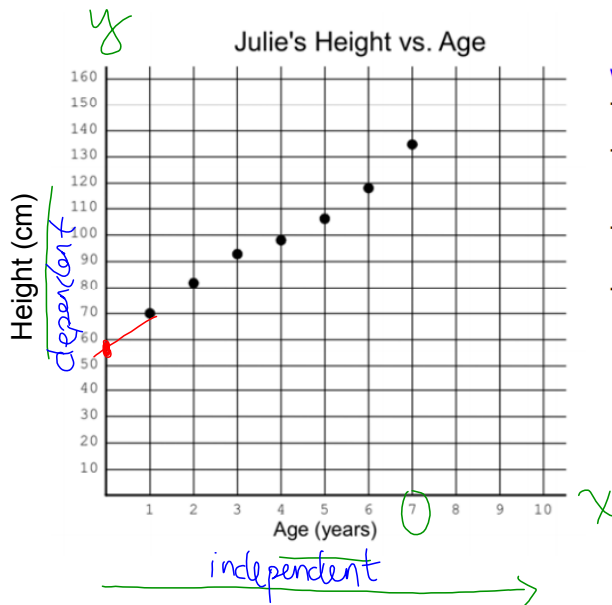
Variables

The *independent variable* is located on the __X__ - axis.

This variable does not depend on the other variable.

The *dependent variable* is located on the __y__ - axis.

This variable depends on the other variable.

Independent variable: _Age (years)_
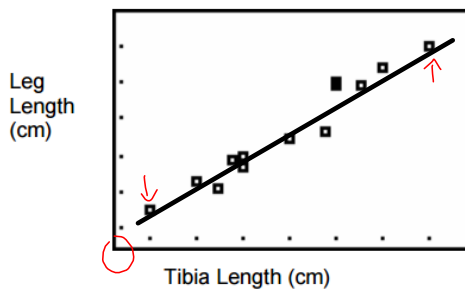
Dependent variable: _height (cm)_

x	y
0	58
1	70
2	83
3	...
...	...

Note:
The independent variable comes *first* in the table of values.

Lines of Best Fit

Leg Length (cm)

Tibia Length (cm)

Line of Best Fit
To be able to make predictions, we need to model the data with a line or a curve of best fit.
Rules for drawing a line of best fit:

1. The line must follow the __trend__.

2. The line should __pass__ through as many points as possible.

3. There should be __an equal number__ of points above and below the line.

4. The line should pass through points all along the line, not just at the ends.
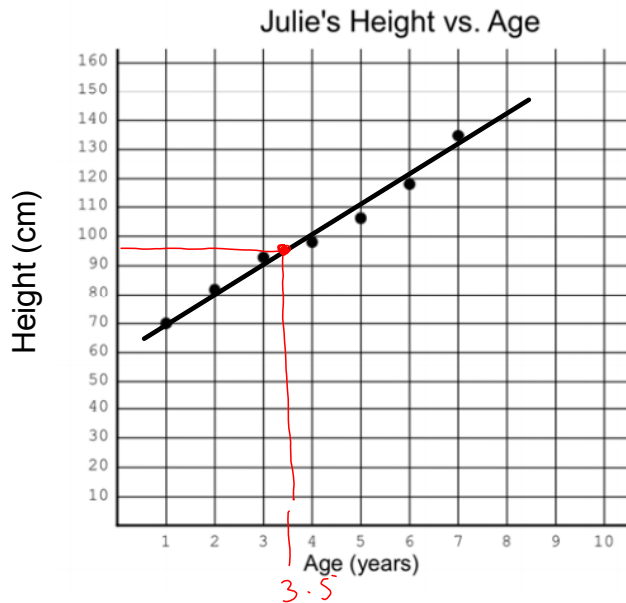
Interpolating

Interpolate

When you interpolate, you are making a prediction __within__ the data.

These predictions are usually __reliable__.

Julie's Height vs. Age

Height (cm) — 160, 150, 140, 130, 120, 110, 100, 90, 80, 70, 60, 50, 40, 30, 20, 10
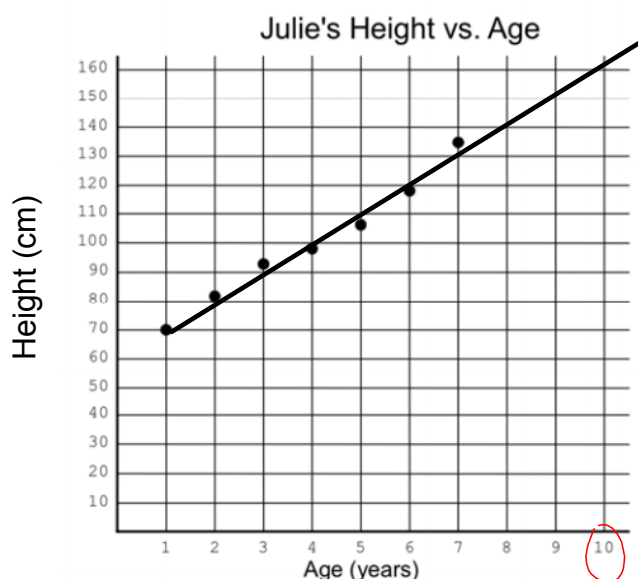
Age (years) — 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

3.5

Extrapolating

Extrapolate

When you extrapolate, you are making a prediction __beyond__ the data.

It often requires you to __extend__ the line.

Julie's Height vs. Age

Height (cm) — 160, 150, 140, 130, 120, 110, 100, 90, 80, 70, 60, 50, 40, 30, 20, 10

Age (years) — 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Finding Slope from the Line of Best Fit

Julie's Height vs. Age
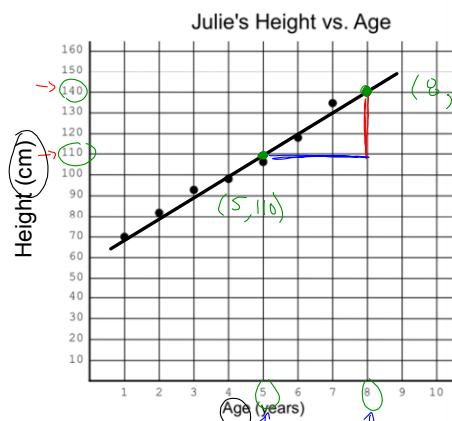
slope : rate of change

$Slope = \dfrac{rise}{run} = \dfrac{\Delta y}{\Delta x}$

$(8, 140)$

$(5, 110)$

$\dfrac{\Delta y}{\Delta x} = \dfrac{140 - 110}{8 - 5}$

"delta"

$= \dfrac{30}{3}$

$= \dfrac{10}{1}$

difference, change in height, age.

i) What was the slope of the line of best fit? $\dfrac{10}{1}$

ii) What is the meaning of the slope for this relationship--height vs. age?

$slope = \dfrac{10\ cm}{1\ yr}$

For every year of Julie's life, she gains, on average, 10 cm in height.

Practice

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to
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pdf

Interactive Quiz

https://www.mathsisfun.com/data/scatter-xy-plots.html