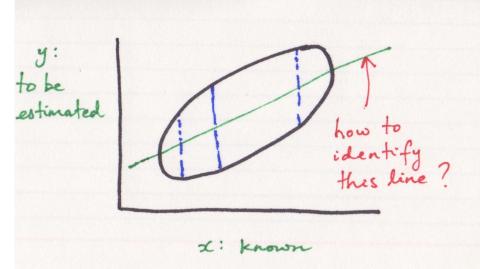
# How to identify the best line?

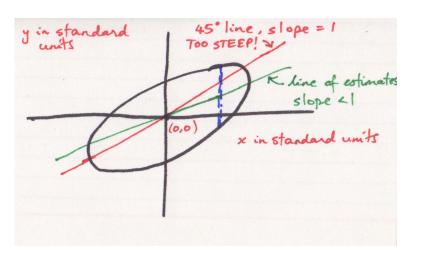
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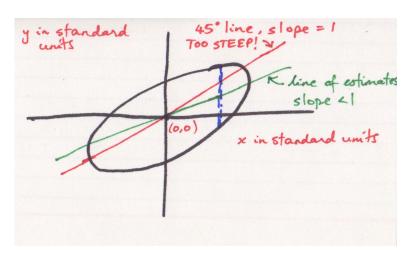
# The picture in standard units

2 / 5

## The picture in standard units



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The estimates are on the green line. The slope of the green line is r.

```
Equation of the regression line 

estimate of y, = r \times  given x in standard units of y in standard units of x
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#### Example of use:

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#### **Example of use:**

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#### Estimate the weight of a person who is 73 inches tall.

• 73 inches, in standard units = (73 - 67)/3 = 2

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r = 0.6

scatter diagram is roughly football shaped

- 73 inches, in standard units = (73 67)/3 = 2
- estimate of weight, in standard units =  $0.6 \times 2 = 1.2$

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Equation of the regression line

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Weights: average 160 pounds, SD 20 pounds

r = 0.6

scatter diagram is roughly football shaped

- 73 inches, in standard units = (73 67)/3 = 2
- estimate of weight, in standard units =  $0.6 \times 2 = 1.2$
- estimate of weight, in pounds =  $1.2 \times 20 + 160 = 184$  pounds

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Midterm and final scores in a large class have a correlation of 0.5. The scatter diagram is roughly football shaped.

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football shaped: both variables roughly normal

• given x, in standard units

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One of the students is on the 80th percentile of midterm scores. Estimate the student's percentile rank on the final.

- given x, in standard units
- = 80th percentile of standard normal curve

Midterm and final scores in a large class have a correlation of 0.5. The scatter diagram is roughly football shaped.

One of the students is on the 80th percentile of midterm scores. Estimate the student's percentile rank on the final.

- given x, in standard units
- = 80th percentile of standard normal curve
- z = 0.842, from applet

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- given x, in standard units
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- estimate of final score, in standard units =  $0.5 \times 0.842 = 0.421$

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**Answer:** roughly 66th percentile on the final

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- First find the given x in standard units.
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- Now convert your estimate from standard units to the units that are required.