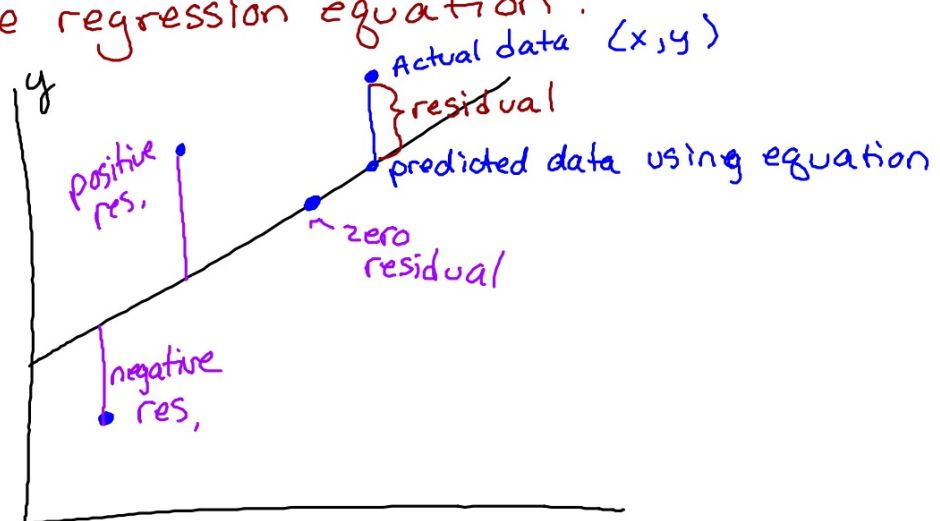


### 10.3 Least squares regression

Another way to improve our regression line equation

A residual is the vertical distance between a data point and the graph of the regression equation.



The least squares regression line is the one that has the smallest possible value for the sum of the squares of the residuals.

# USE Calculator on Exams!!

Ex Cab Fares  
From Airport  
to Singapore

Distance

Fare

574

178

370

138

612

94

1216

278

409

158

1502

258

946

198

998

188

189

98

787

179

210

138

737

98

HW 10E  
P. 347  
1-4

a) graph scatter plot on calc.  
+ line of best fit

b) write your equation  
for line of best fit  
 $y = 0,117x + 83,3$

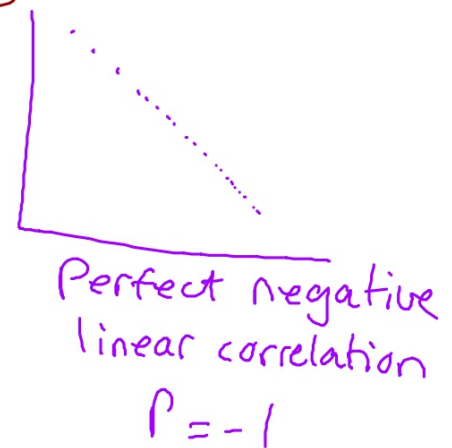
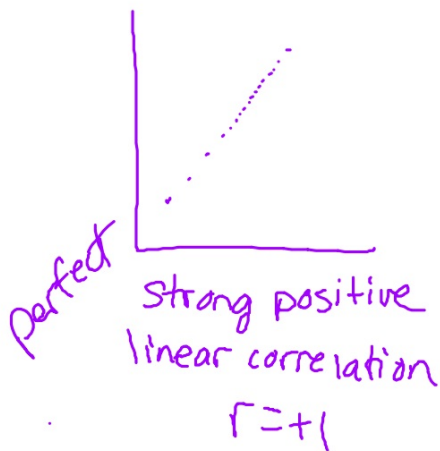
c) estimate cost of  
1000 km flight  
200,30

## 10.4 Measuring Correlation

We can classify the strength of a correlation using a numeric scale.

The Pearson product-moment correlation coefficient (denoted by  $r$ ) is a measure of the correlation between  $+1$  and  $-1$ , inclusive. It is widely used in the sciences as a strength of linear dependence between two variables.

\* correlation does not imply causation



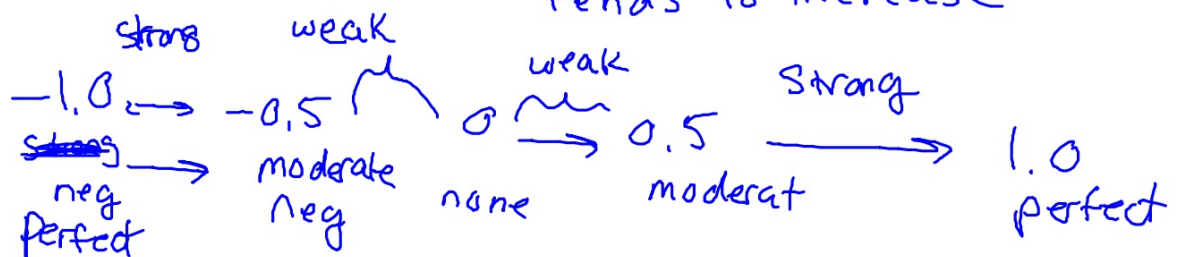
A social psychologist thinks that there is a correlation between income and education. She found that people with higher income have more years of education. The results of her survey are shown below.

You can also p  
that people wi  
years of educa  
have higher in

Person	A	B	C	D	E	F	G	H	I	J
Income (thousand \$)	125	100	40	35	41	29	35	24	50	60
Years of education	19	20	16	16	18	12	14	12	16	17

- a Find the  $r$ -value.  $0.79 = r$
- b What can you say about the strength of the correlation? Strong and positive
- c What does the sign of the  $r$ -value indicate? ~~as income ↑~~

as education ↑, income  
tends to increase



HW 10F P352 #1-5 odd