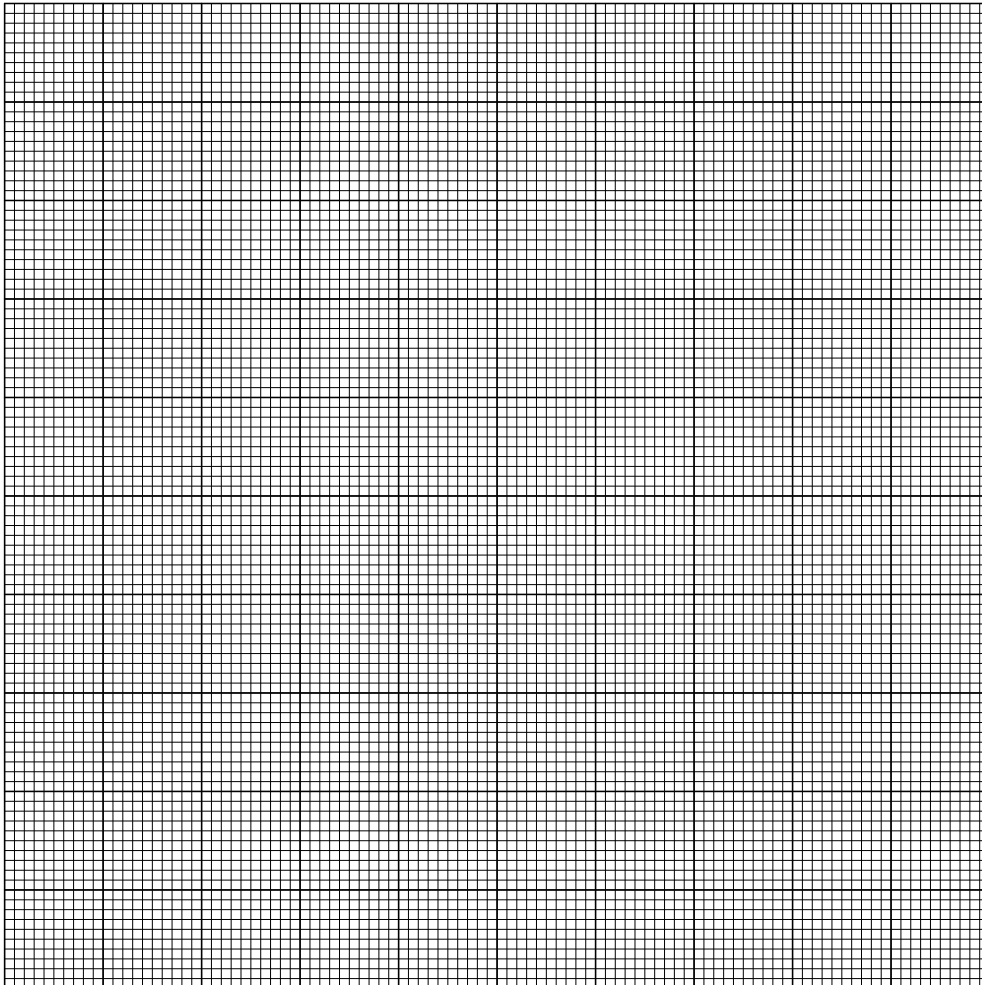


1. Problem:

You have collected the following data:

x	y
9.8	56
6.3	62
7.4	62
5.9	64
2.8	76
6.5	68
4.8	72
4.1	73

Please plot the data and a corresponding regression line.



Solution: Remember the formula for the correlation coefficient.

$$r = \frac{\sum x_i y_i - n\bar{x}\bar{y}}{(n-1)s_x s_y}$$

We calculate the necessary values.

x	y	xy
9.8	56	548.8
6.3	62	390.6
7.4	62	458.8
5.9	64	377.6
2.8	76	212.8
6.5	68	442
4.8	72	345.6
4.1	73	299.3
$\sum x = 47.6$	$\sum y = 533$	$\sum x_i y_i = 3075.5$
$\bar{x} = 5.95$	$\bar{y} = 66.6$	
$s_x = 2.14$	$s_y = 6.78$	

The regression line has the form

$$y = a + bx$$

So, a is the y -intercept and b is the slope. We have formulas to determine them:

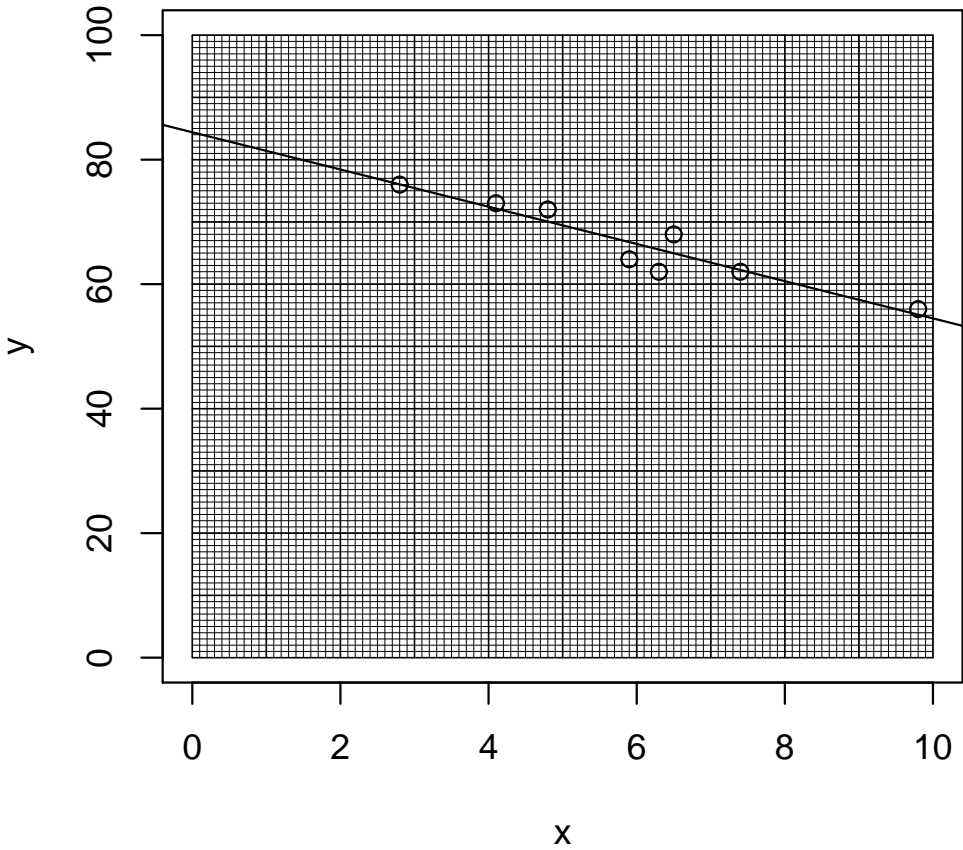
$$b = r \frac{s_y}{s_x} = -0.944 \cdot \frac{6.78}{2.14} = -2.99$$

$$a = \bar{y} - b\bar{x} = 66.6 - (-2.99) \cdot 5.95 = 84.4$$

Our regression line:

$$y = 84.4 + (-2.99)x$$

Make a plot.

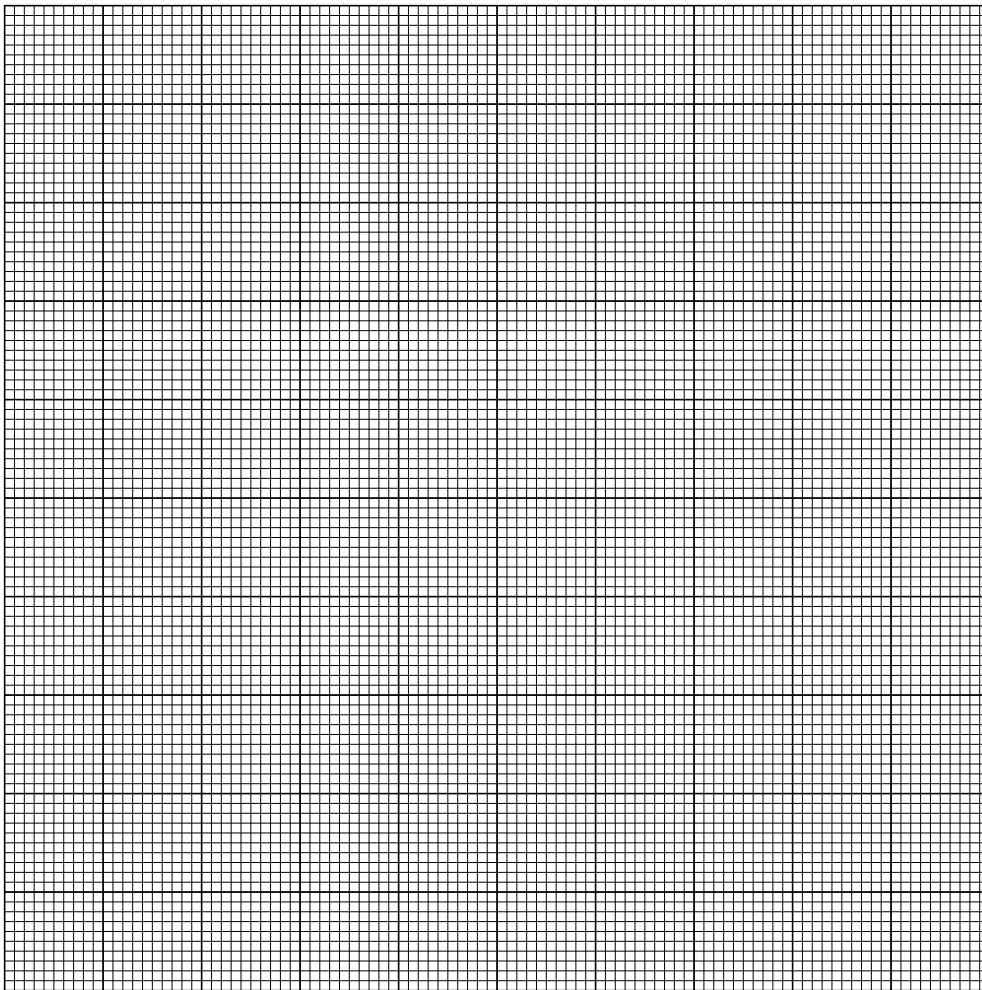


2. Problem:

You have collected the following data:

x	y
8.5	7
6.4	6.1
4.4	4.8
1	5.2
9.4	7.5

Please plot the data and a corresponding regression line.



Solution: Remember the formula for the correlation coefficient.

$$r = \frac{\sum x_i y_i - n\bar{x}\bar{y}}{(n-1)s_x s_y}$$

We calculate the necessary values.

x	y	xy
8.5	7	59.5
6.4	6.1	39.04
4.4	4.8	21.12
1	5.2	5.2
9.4	7.5	70.5
$\sum x = 29.7$	$\sum y = 30.6$	$\sum x_i y_i = 195.36$
$\bar{x} = 5.94$	$\bar{y} = 6.12$	
$s_x = 3.37$	$s_y = 1.15$	

The regression line has the form

$$y = a + bx$$

So, a is the y -intercept and b is the slope. We have formulas to determine them:

$$b = r \frac{s_y}{s_x} = 0.878 \cdot \frac{1.15}{3.37} = 0.3$$

$$a = \bar{y} - b\bar{x} = 6.12 - 0.3 \cdot 5.94 = 4.34$$

Our regression line:

$$y = 4.34 + 0.3x$$

Make a plot.

