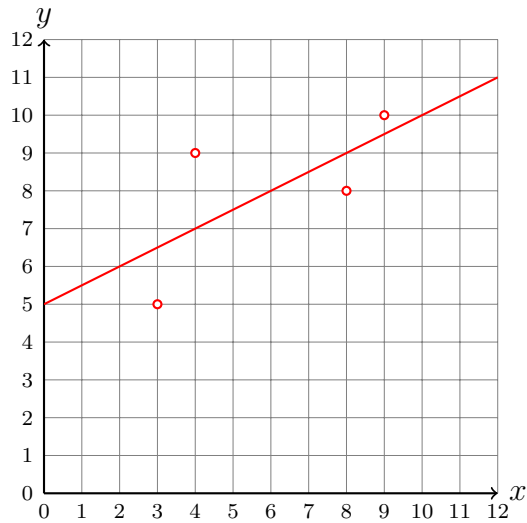


Aufgabe 1



Aufgabe 1

x_i	$x_i - \bar{x}$	$(x_i - \bar{x})^2$	y_i	$y_i - \bar{y}$	$(y_i - \bar{y})^2$	$(x_i - \bar{x})(y_i - \bar{y})$
4	-2	4	9	1	1	-2
3	-3	9	5	-3	9	9
9	3	9	10	2	4	6
8	2	4	8	0	0	0
24	0	26	32	0	14	13

$$\bar{x} = 6, \bar{y} = 8$$

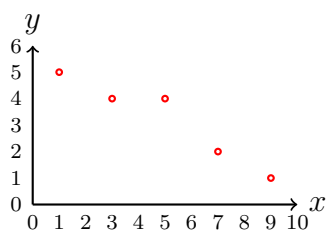
$$a = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sum(x_i - \bar{x})^2} = \frac{13}{26} = \frac{1}{2}$$

$$b = \bar{y} - a \cdot \bar{x} = 5; \quad y = \frac{1}{2} \cdot x + 5$$

$$r_{xy} = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x}) \cdot \sum(y_i - \bar{y})}} = \frac{13}{\sqrt{364}} = 0.681$$

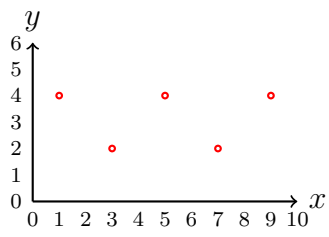
Aufgabe 2 (a)

$$r_{xy} = -0.95$$



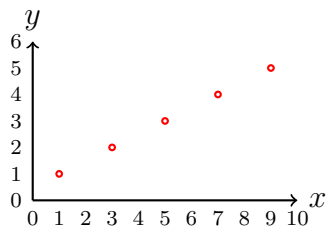
Aufgabe 2 (b)

$$r_{xy} = 0$$



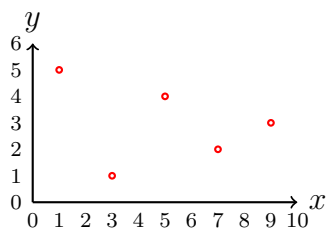
Aufgabe 2 (c)

$$r_{xy} = 1$$



Aufgabe 2 (d)

$$r_{xy} = -0.29$$



Aufgabe 3

$$f(x) = x^2 - x + 2$$

x	$\hat{y} = f(x)$	y	$\hat{y} - y$	$(\hat{y} - y)^2$
-1	4	5	-1	1
0	2	2	0	0
1	2	0	2	4
2	4	2	2	4
				9

$$g(x) = x^2 + x - 3$$

x	$\hat{y} = g(x)$	y	$\hat{y} - y$	$(\hat{y} - y)^2$
-1	-3	5	-8	64
0	-3	2	-5	25
1	-1	0	-1	1
2	3	2	1	1
				91

$$h(x) = x^2 - 2x + 1$$

x	$\hat{y} = h(x)$	y	$\hat{y} - y$	$(\hat{y} - y)^2$
-1	4	5	-1	1
0	1	2	-1	1
1	0	0	0	0
2	1	2	-1	1
				3

Die Funktion h approximiert die Daten mit der Summe der quadrierten Abweichungen von 3 am besten.