

Potenzieren

$$a^n \cdot a^m = a^{n+m}$$

$$3a^3 + 3a^3 = 6a^3$$

$$(a \cdot b)^n = a^n \cdot b^n$$

$$a^m : a^n = a^{m-n} = \frac{1}{a^{n-m}}$$

$$\frac{a^m}{a^n} = a^m \cdot \frac{1}{a^n} = a^m \cdot a^{-n} = a^{m+(-n)}$$

$$(a^m)^n = a^{m \cdot n}$$

$$(a + b)^0 = 1$$

$$(a + b)^1 = a + b$$

$$(a + b)^2 = a^2 + 2ab + b^2$$

$$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$$

$$(a + b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$$

$$(a + b)^2 = a^2 + 2ab + b^2$$

$$(a - b)^2 = a^2 - 2ab + b^2$$

$$(a + b) \cdot (a - b) = a^2 - b^2$$

~~$$\frac{a}{b - c} = \frac{a}{b} - \frac{a}{c} \text{ falsch}$$~~

$$\frac{b - c}{a} = \frac{b}{a} - \frac{c}{a}$$

$$x^{-3} = \frac{1}{x^3}$$

$$s = v \cdot t$$

Wurzelexponent

Radizieren

Radikant

$$\sqrt[n]{a} = x \Leftrightarrow x^n$$

$$\sqrt[n]{a^x} = a^{x/n}$$

$$\sqrt[n]{a \cdot b} = \sqrt[n]{a} \cdot \sqrt[n]{b}$$

$$\left(\sqrt[n]{a}\right)^x = \sqrt[n]{a^x}$$

$$\sqrt[b]{\sqrt[n]{a^{bx}}} = \sqrt[b]{\sqrt[n]{a^{bx}}} = \sqrt[n]{a^x}$$

$$\sqrt[8]{a^6} = \cancel{\sqrt[2 \cdot 4]{a^{2 \cdot 3}}} = \sqrt[4]{a^3}$$

$$\sqrt[n]{\sqrt[x]{a}} = \sqrt[x]{\sqrt[n]{a}} = a^{1/n \cdot x} = \sqrt[nx]{a}$$

$$\sqrt[4]{\sqrt[3]{x^2}} \cdot \sqrt[6]{\sqrt{x^{10}}} + \sqrt[9]{y^6} \sqrt[4]{y^{12}}$$

$$\sqrt[12]{x^2} \cdot \sqrt[12]{x^{10}} + \sqrt[9]{y^9}$$

$$\cancel{\sqrt[12]{x^{12}}} + \cancel{\sqrt[9]{y^9}}$$

$$x + y$$

Funktionsgleichungen

Allgemeine Form:

$$Ax + By + C = 0$$

Normal Form (explizite Form):

$$y = mx + b$$
$$y = ax + b$$

Achsenabschnitts Form:

$$\frac{x}{a} + \frac{y}{b} = 1$$

Punktsteigungs Form:

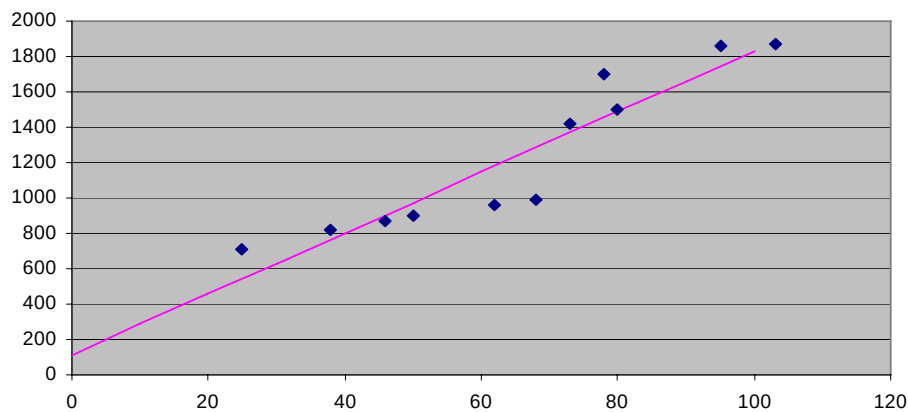
$$y - y_1 = m(x - x_1)$$

Zweipunkt Form:

$$(y - y_1)(x_1 - x_2) = (x - x_1)(y_1 - y_2)$$

Lineare Regression

	X	Y	XY	X^2	Y^2
1	25	710	17750	625	504100
2	38	820	31160	1444	672400
3	46	870	40020	2116	756900
4	50	900	45000	2500	810000
5	62	960	59520	3844	921600
6	68	990	67320	4624	980100
7	73	1420	103660	5329	2016400
8	78	1700	132600	6084	2890000
9	80	1498	119840	6400	2244004
10	95	1860	176700	9025	3459600
11	103	1870	192610	10609	3496900
Summe	718	13598	986180	52600	18752004



$$\bar{x} = \frac{\sum x}{n} = \frac{718}{11} = 65.27$$

$$\bar{y} = \frac{\sum y}{n} = \frac{13598}{11} = 1236.2$$

$$a = \frac{\sum x_i \cdot y_i - n \cdot \bar{x} \cdot \bar{y}}{\sum x_i^2 - n \cdot \bar{x}^2} = \frac{986180 - 11 \cdot 65.27 \cdot 1236.2}{52600 - 11 \cdot 65.27^2} = 17.195$$

$$b = \bar{y} - a\bar{x} = 1236.2 - 17.195 \cdot 65.27 = 113.8$$

$$r^2 = \frac{a \left(\sum x_i y_i - n \cdot \bar{x} \cdot \bar{y} \right)}{\sum y_i^2 - n \cdot \bar{y}^2} = \frac{17.195(986180 - 11 \cdot 65.27 \cdot 1236.2)}{18752004 - 11 \cdot 1236.2^2} = 0.873$$

$$y = b + ax$$

$$y = 113.8 + 17.195x$$

a = Steigung