Beispiel 3 für quadratische Gleichungen

$$x^2 + 4x + 4 = 0$$

Quadratische Ergänzung

$$x^2 + 4x + 4 = 0$$

$$x^2 + 4x + 4 - 4 = -4$$

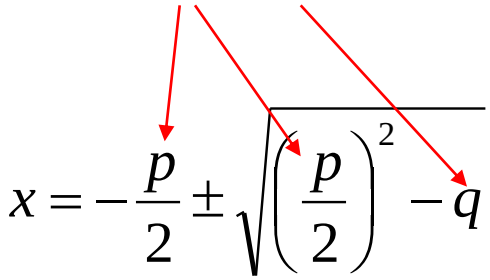
$$(x + 2)^2 = 0$$

$$x = -2$$

$$x_1 = -2$$
$$x_2 = -2$$

pq Formel

$$x^2 + 4x + 4 = 0$$



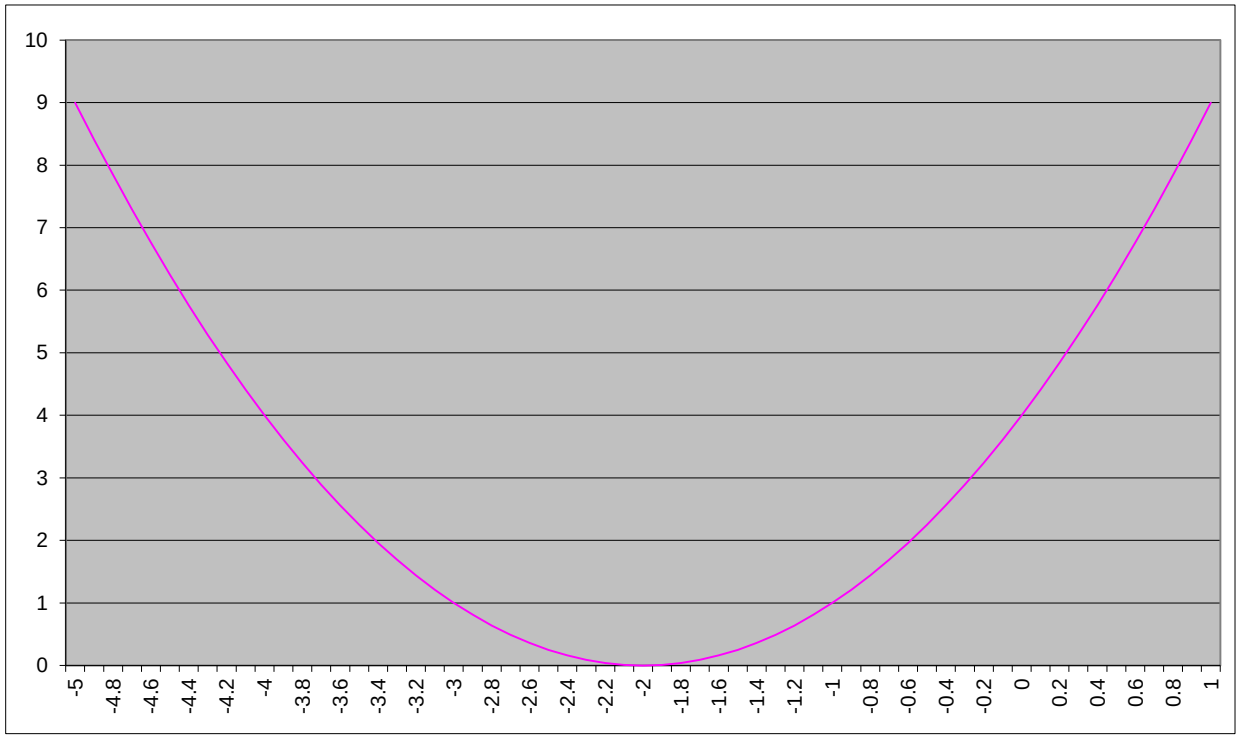
$$x = -\frac{p}{2} \pm \sqrt{\left(\frac{p}{2}\right)^2 - q}$$

$$x = -\frac{4}{2} \pm \sqrt{\left(\frac{4}{2}\right)^2 - 4}$$

$$x_{1,2} = -2$$

Die Parabel

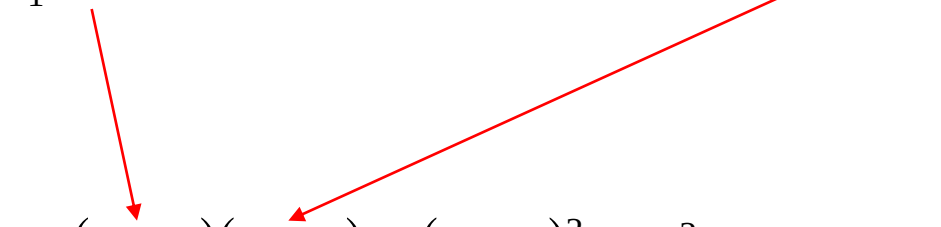
$$f(x) = x^2 + 4x + 4$$



Produktdarstellung

$x_1 = -2$ $\qquad$ $x_2 = -2$

$x_1 + 2 = 0$ $\qquad$ $x_2 + 2 = 0$



$$(x+2)(x+2) = (x+2)^2 = x^2 + 4x + 4$$