



Beispiel 1 für quadratische Gleichungen

$$x^2 + 3x + 2 = 0$$

Quadratische Ergänzung

$$x^2 + 3x + 2 = 0$$

$$x^2 + 3x = -2$$

$$x^2 + 3x + \left(\frac{3}{2}\right)^2 - \left(\frac{3}{2}\right)^2 = -2$$

$$x^2 + 2\left(\frac{3}{2}\right)x + \left(\frac{3}{2}\right)^2 - \left(\frac{3}{2}\right)^2 = -2$$

$$x^2 + 2\left(\frac{3}{2}\right)x + \left(\frac{3}{2}\right)^2 = \left(\frac{3}{2}\right)^2 - 2$$

$$\left(x + \frac{3}{2}\right)^2 = \left(\frac{3}{2}\right)^2 - 2$$

$$x + \frac{3}{2} = \pm \sqrt{\left(\frac{3}{2}\right)^2 - 2}$$

$$x = -\frac{3}{2} \pm \sqrt{\left(\frac{3}{2}\right)^2 - 2}$$

$$x = -\frac{3}{2} \pm \sqrt{\frac{9}{4} - 2}$$

$$x = -\frac{3}{2} \pm \sqrt{\frac{9-8}{4}}$$

$$x = -\frac{3}{2} \pm \frac{1}{2}$$

$$x_1 = -\frac{3}{2} + \frac{1}{2} = \frac{1-3}{2} = -1$$

$$x_2 = -\frac{3}{2} - \frac{1}{2} = \frac{-1-3}{2} = -2$$

pq Formel

$$x^2 + 3x + 2 = 0$$

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

$$x = -\frac{3}{2} \pm \sqrt{\left(\frac{3}{2}\right)^2 - 2}$$

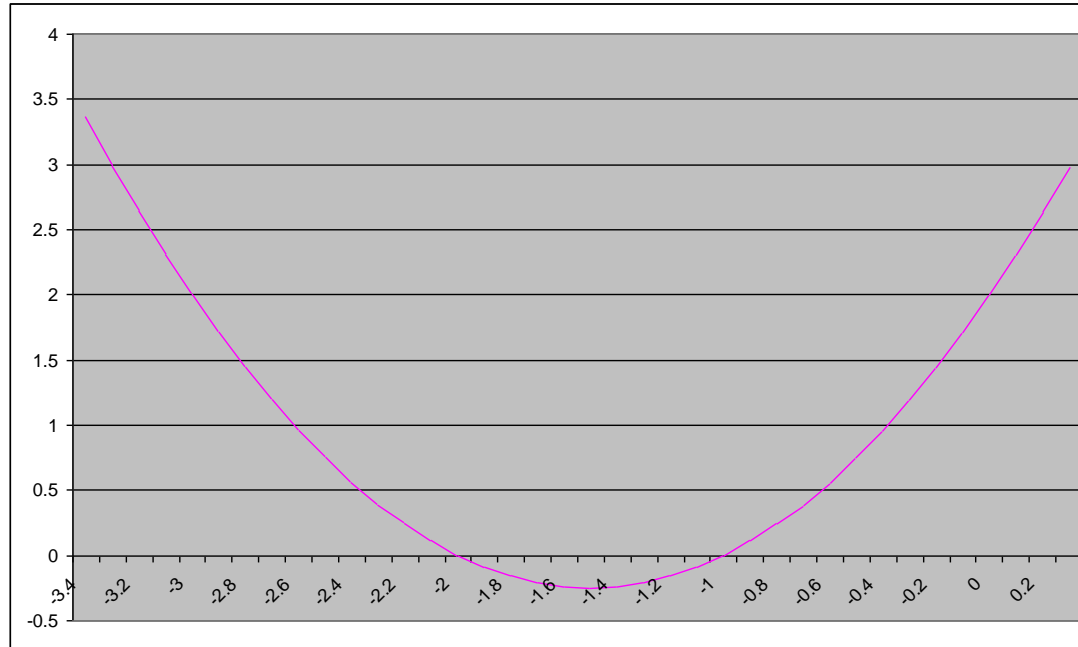
$$x = -\frac{3}{2} \pm \sqrt{\frac{9}{4} - 2}$$

$$x_1 = -\frac{3}{2} + \frac{1}{2} = -1$$

$$x_2 = -\frac{3}{2} - \frac{1}{2} = -2$$

Die Parabel

$$f(x) = x^2 + 3x + 2$$



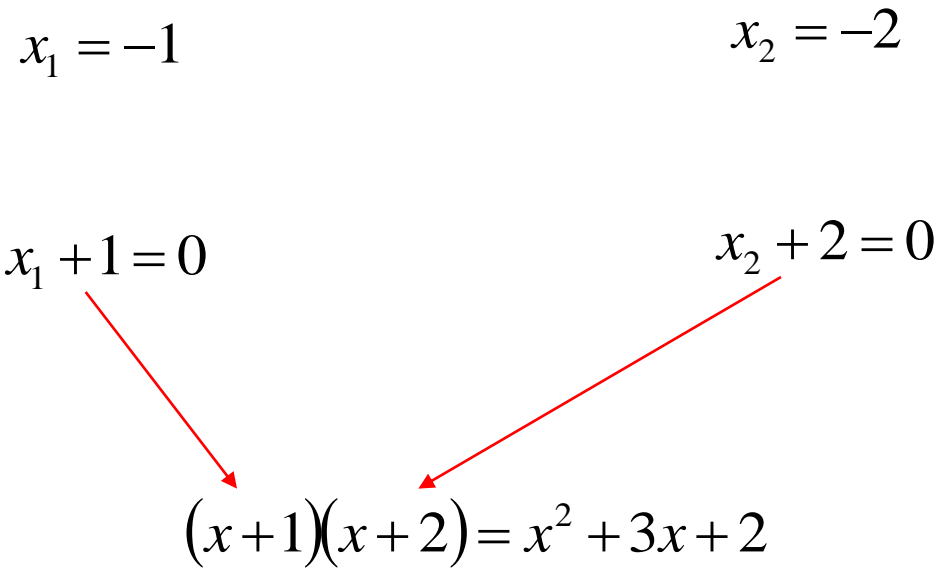
Produktdarstellung

$$x_1 = -1$$

$$x_2 = -2$$

$$x_1 + 1 = 0$$

$$x_2 + 2 = 0$$


$$(x+1)(x+2) = x^2 + 3x + 2$$