$8x^2 + 112x + 384 = 0 \quad | -384$

$\Leftrightarrow 8x^2 + 112x = -384 \quad | :8$

$\Leftrightarrow x^2 + 14x = -48 \quad | +7^2$

$\Leftrightarrow x^2 + 14x + 7^2 = -48 + 7^2$

$\Leftrightarrow (x+7)^2 = 1 \quad | \sqrt{}$

$x+7 = \pm 1 \quad | -7$

$x = +1 - 7 = -6$

$x = -1 - 7 = -8$

$\mathbb{L} = \{-6; -8\}$

$a \cdot x^2 + b \cdot x + c = 0 \quad | -c$

$\Leftrightarrow a \cdot x^2 + b \cdot x = -c \quad | :a$

$\Leftrightarrow x^2 + \frac{b}{a} \cdot x = \frac{-c}{a}$

ab jetzt: $\frac{b}{a} =: p$ $\qquad \frac{c}{a} =: q$

$\Leftrightarrow x^2 + p \cdot x = -q \quad | +\left(\frac{p}{2}\right)^2$

$\Leftrightarrow x^2 + p \cdot x + \left(\frac{p}{2}\right)^2 = \left(\frac{p}{2}\right)^2 - q$

$\Leftrightarrow \left(x + \frac{p}{2}\right)^2 = \left(\frac{p}{2}\right)^2 - q \quad | \sqrt{}$

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

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

$\mathbb{L} = \left\{-\frac{p}{2} + \sqrt{\left(\frac{p}{2}\right)^2 - q}; -\frac{p}{2} - \sqrt{\left(\frac{p}{2}\right)^2 - q}\right\}$

PQ-Formel

Eine quadratische Gleichung der Form

$$x^2 + p \cdot x + q = 0 \quad \text{hat die Lösungen}$$

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

Bsp: $-3x^2 + 36x - 105 = 0$ | :(-3) damit x^2 alleine steht

$\Leftrightarrow \quad x^2 - 12x + 35 = 0$ $\quad p = -12 \quad q = +35$

$$x = -\frac{-12}{2} \pm \sqrt{\left(\frac{-12}{2}\right)^2 - 35}$$

$$\Rightarrow \quad x = +6 \pm \sqrt{1}$$

$\Rightarrow \quad x = 6 + 1 = 7$

$\quad\quad x = 6 - 1 = 5$

$$\mathbb{L} = \{5; 7\}$$