

En lösningformel - pq-formeln

3 typer av andragradsfunktioner

1. $x^2 = a$ $x = \pm\sqrt{a}$

2. $x^2 + ax = 0$ $x(x+a) = 0$ $x_1 = 0$ $x_2 = -a$

3. $x^2 + px + q = 0$

Pq-formeln: $x^2 + px + q = 0$

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

Notera
teckenbyte

Notera
teckenbyte

Ex) Lös ekvationerna

a) $x^2 + 4x - 5 = 0$

a) $x = -\frac{4}{2} \pm \sqrt{\left(\frac{4}{2}\right)^2 + 5}$

$= -2 \pm \sqrt{4 + 5}$ teckenbyte!

$= -2 \pm \sqrt{9}$

$= -2 \pm 3$ $x_1 = -2 + 3 = 1$ $x_2 = -5$

b) $x^2 - 6x + 5 = 0$

b) $x = \frac{6}{2} \pm \sqrt{\left(\frac{6}{2}\right)^2 - 5}$

$= 3 \pm \sqrt{9 - 5}$ teckenbyte

$= 3 \pm \sqrt{4}$

$= 3 \pm 2$

$x_1 = 3 + 2 = 5$

$x_2 = 3 - 2 = 1$

c) $x = \frac{10}{2} \pm \sqrt{\left(\frac{10}{2}\right)^2 + 11}$

$= 5 \pm \sqrt{25 + 11}$

$= 5 \pm \sqrt{36}$

$= 5 \pm 6$

$x_1 = 5 + 6 = 11$

$x_2 = 5 - 6 = -1$

c) $x^2 - 10x - 11 = 0$

$$d) 2x^2 - 4x - 30 = 0 \quad \text{Dela allt p 2}$$

$$x^2 - 2x - 15 = 0$$

$$x = \frac{2}{2} \pm \sqrt{\left(\frac{2}{2}\right)^2 + 15}$$

$$= 1 \pm \sqrt{1+15}$$

$$= 1 \pm \sqrt{16}$$

$$= 1 \pm 4 \quad x_1 = 5 \quad x_2 = -3$$

$$e) 3x^2 + 4x - 13 = 2x^2 - 2x + 3$$

$$x^2 + 6x - 16 = 0$$

$$x = -\frac{6}{2} \pm \sqrt{\left(\frac{6}{2}\right)^2 + 16}$$

$$= -3 \pm \sqrt{9+16}$$

$$= -3 \pm \sqrt{25}$$

$$= -3 \pm 5 \quad x_1 = -3+5=2 \quad x_2 = -8$$