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# Lektion 3) Equations - en repetition

$$\text{Ex 1)} \quad (x+3)^2 = 49$$

$$x+3 = \pm \sqrt{49}$$

$$x+3 = \sqrt{49}$$

$$x = 7 - 3$$

$$x_1 = 4$$

$$x+3 = -\sqrt{49}$$

$$x = -7 - 3$$

$$x_2 = -10$$

Svare

$$\begin{cases} x_1 = 4 \\ x_2 = -10 \end{cases}$$

$$\text{Ex 2)} \quad 4x^2 - 20x - 11 = 0$$

$$x^2 - 5x - \frac{11}{4} = 0$$

$$x = -\frac{-5}{2} \pm \sqrt{\left(\frac{5}{2}\right)^2 - \left(-\frac{11}{4}\right)}$$

$$x = 2,5 \pm \sqrt{\frac{25}{4} + \frac{11}{4}}$$

$$x = 2,5 \pm 3$$

$$\begin{cases} x_1 = 5,5 \\ x_2 = -0,5 \end{cases}$$

$$\text{Ex 3)} \quad x^3 - 8x^2 + 15x = 0$$

(3:e grads ekv. / nytt)

$$x(x^2 - 8x + 15) = 0$$

$x=0$  →

$$x^2 - 8x + 15 = 0$$

$$x = 4 \pm \sqrt{4^2 - 15}$$

$$x_2 = 3$$

$$x_3 = 5$$

Alt.

$$\underbrace{(x-3)}_{=0} \underbrace{(x-5)}_{=0} = 0$$

$$\text{Svar: } \begin{cases} x_1 = 0 \\ x_2 = 3 \\ x_3 = 5 \end{cases}$$

$$\text{Ex 4)} \quad (x-4)(2x+7)(5x+2) = 0$$

Faktoriserat

$$1) \quad x - 4 = 0$$

$$2) \quad 2x + 7 = 0$$

$$3) \quad 5x + 2 = 0$$

$$\text{Svar: } \begin{aligned} x_1 &= 4 \\ x_2 &= -\frac{7}{2} = -3,5 \\ x_3 &= -\frac{2}{5} = -0,4 \end{aligned}$$

Absolutbeloppet

$\sqrt{a^2} = |a|$

positivt  
tal.

$x^2 = 9$

$\sqrt{9} = 3$

(även  $\sqrt[2]{9}$ )

$x = \pm\sqrt{9} = \pm 3$

$\sqrt{(-3)^2} = 3$

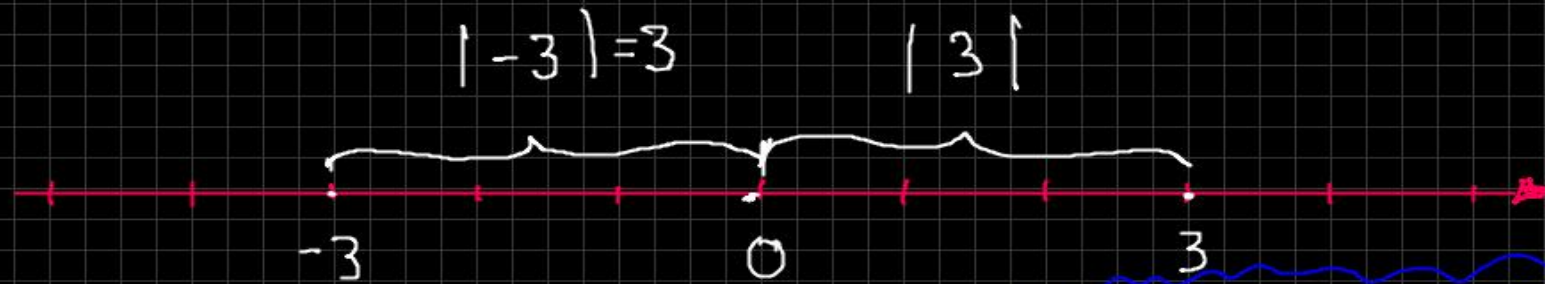
[ Obs. Problem: Om  $\sqrt{9} = -3$  ty,  
 $-3 \neq \sqrt{9} = \sqrt{3^2} = 3$  motsägelse! ]

$|a| = \begin{cases} a, & a \geq 0 \\ -a, & a < 0 \end{cases}$

$$|-3| = 3$$

$$|3| = 3$$

En geometrisk tolkning



avståndet till origo  
 $|x| = |x - 0|$

Ex 1) Lös ekvationen  
 $|x - 4| = 3$

$$|1 - 4| = 3$$

$$|7 - 4| = 3$$



