STACK -Toisen asteen yhtälö

1. $x^2 = 6x - 2 \iff -x^2 + 6x - 2 = 0 \iff x = \frac{-6 \pm \sqrt{6^2 - 4 \cdot -1 \cdot -2}}{2 \cdot -1}$

$x = \frac{-6 \pm \sqrt{36 - 8}}{-2}$

$x = \frac{-6 \pm \sqrt{28}}{-2}$

$x \approx 0{,}35 \quad \vee \quad x = 5{,}65$

2. $9x + 5x^2 = 3x$

$5x^2 + 9x - 3x = 0$

$5x^2 + 6x = 0$

$x(5x + 6) = 0$

$x = 0 \quad \vee \quad 5x + 6 = 0$

$5x = -6 \quad | : 5$

$x = -\frac{6}{5}$

$x = -\frac{6}{5} \approx -1.2$

3. $4(x^2 - 2x + 2) = -4$

$4x^2 - 8x + 8 = -4$

$4x^2 - 8x + 8 + 4 = 0$

$4x^2 - 8x + 12 = 0$

$\iff x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4 \cdot 4 \cdot 12}}{2 \cdot 4}$

$= \frac{8 \pm \sqrt{64 - 192}}{8}$

$= \frac{8 \pm \sqrt{-128}}{8}$

ei ole ratkaisua

4. $2x(7x + 1) - 10 = 2x$

$14x^2 + 2x - 10 - 2x = 0$

$14x^2 - 10 = 0$

$14x^2 = 10 \quad | : 14$

$x^2 = \frac{10}{14}$

$x = \sqrt{\frac{10}{14}}$

$x \approx \pm 0{,}85$

5. $\frac{2x - 5}{3} = \frac{6}{x}$

$\iff$

$2x^2 - 5x = 18$

$2x^2 - 5x - 18 = 0$

$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4 \cdot 2 \cdot -18}}{2 \cdot 2}$

$= \frac{5 \pm \sqrt{25 + 144}}{4}$

$= \frac{5 \pm \sqrt{169}}{4}$

$x = 4{,}5 \quad \vee \quad x = -2$

6. $900\,m^2 = x(x + 8)$

$900 = x^2 + 8x$

$x^2 + 8x - 900 = 0$

$x = \frac{-8 \pm \sqrt{8^2 - 4 \cdot -900}}{2}$

$x = \frac{-8 \pm \sqrt{64 + 3600}}{2}$

$x = \frac{-8 \pm \sqrt{3664}}{2}$

$x \approx 26{,}265 \quad \vee \quad x \approx -34{,}265$

ympärismitta $= 2(8 + x + x)$

pituus : 26.265

leveys : $26.265 + 8 = 34.265$

$\approx 127{,}1\,m$