

MABI ratkaisut

$$\begin{aligned} 1. a) \quad & -4(2-x) - 7x = 5 \\ & -8 + 4x - 7x = 5 \\ & -3x = 13 \\ & x = -\frac{13}{3} = -4\frac{1}{3} = -4,333... \end{aligned}$$

$$\begin{aligned} b) \quad & 3x^2 - 2 - 5x = 0 \\ & \begin{array}{ccc} a & c & b \\ & \uparrow & \end{array} \\ & x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4 \cdot 3 \cdot (-2)}}{2 \cdot 3} \\ & x = \frac{5 \pm \sqrt{25 + 24}}{6} = \frac{5 \pm \sqrt{49}}{6} \\ & x = \frac{5 \pm 7}{6} = \begin{cases} 2 \\ -\frac{2}{6} = -\frac{1}{3} \end{cases} \end{aligned}$$

$$\begin{aligned} c) \quad & 3x(x+2) = 0 \\ & 3x^2 + 6x = 0 \\ & \begin{array}{ccc} a & b & c=0! \end{array} \\ & x = \frac{-6 \pm \sqrt{6^2 - 4 \cdot 3 \cdot 0}}{2 \cdot 3} \\ & x = \frac{-6 \pm 6}{6} = \begin{cases} 0 \\ -2 \end{cases} \end{aligned}$$

$$2. \quad a) \quad \frac{\text{muutos}}{\text{alkup.}} \cdot 100\% = \frac{10,00}{19,99} \cdot 100\% \approx 25\%$$

b) $a = \text{hinta alussa}$

$+5\% \rightarrow \text{kerto } 1,05 \text{ illa jne.}$

$$a \cdot \underset{\substack{\uparrow \\ +5\%}}{1,05} \cdot \underset{\substack{\uparrow \\ +3\%}}{1,03} \cdot \underset{\substack{\uparrow \\ -8\%}}{0,92} = \underset{\substack{\uparrow \\ -0,5\%}}{0,995} a$$

Vast: laskee
0,5%

$$3. \quad p = \frac{m}{l^2}$$

$$a) \quad p = 25, \quad l = 2 \text{ m}$$

$$25 = \frac{m}{2^2} \rightarrow m = 4 \cdot 25 = 100$$

Vast: 100 kg

$$b) \quad p = 25, \quad m = 60$$

$$25 = \frac{60}{l^2} \xrightarrow[\text{ristin}]{\text{kerto}} l^2 = \frac{60}{25}$$

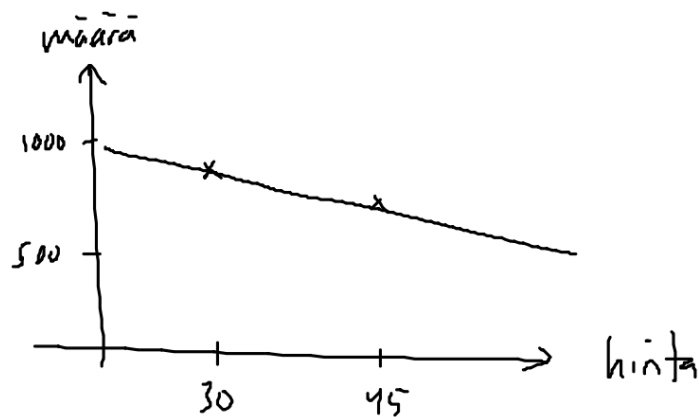
$$Vast: n. 1,55 \text{ m} \quad l = \sqrt{\frac{60}{25}} = 1,55$$

4. a) hinta noussut $15 \text{ €} = 6 \cdot 2,5 \text{ €}$

↑
jokaisen pientä 10 eli
yht. $6 \cdot 10 = 60$

V: Myynti 760

b)



tiiedetään $(30, 820)$ ja $(45, 760)$

5. a) $x^2 - 12x + 36 = 0$

$a \quad b \quad c$

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4 \cdot 1 \cdot 36}}{2 \cdot 1} = \frac{12 \pm \sqrt{0}}{2} = 6$$

b) $f(-1) = (-1)^2 - 12 \cdot (-1) + 36 = 1 + 12 + 36 = 49$

c) $f(x) = 2$ eli $x^2 - 12x + 36 = 2$

$$x^2 - 12x + 34 = 0$$

$a \quad b \quad c$

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4 \cdot 1 \cdot 34}}{2 \cdot 1}$$

$$x = \frac{12 \pm \sqrt{8}}{2}$$

6. $x = 8\%$ määrä, $y = 18\%$ määrä

→ valmistaa 15% :sta liuosta $x+y$.

Suola erikseen = suola valmiissa eli

$$0,08x + 0,18y = 0,15(x+y)$$

$$0,08x - 0,15x = 0,15y - 0,18y$$

$$-0,07x = -0,03y$$

$$x = \frac{3}{7} y$$

eli jos y:tä 7 osaa niin x:ää 3.

$$V: \frac{3}{7}$$

7.

$$\begin{array}{r|l} S & v^2 \\ \hline 28 & 50^2 \\ x & 80^2 \end{array}$$

$$\frac{28}{x} = \frac{50^2}{80^2}$$

Kern istin

$$50^2 \cdot x = 28 \cdot 80^2$$

$$2500x = 179200 \quad | : 2500$$

$$x \approx 71,68$$

$$V: \text{ h. } 72 \text{ m}$$