

Nafn:

Leystu þessar jöfnur:

1. $x^2 - 5x - 24 = 0$

$$\begin{aligned} A &= 1 \\ B &= -5 \\ C &= -24 \end{aligned}$$

$$\begin{aligned} D &= (-5)^2 - 4 \cdot 1 \cdot (-24) \\ D &= 121 \end{aligned}$$

$$x_1 = \frac{-(-5) + \sqrt{121}}{2 \cdot 1} = \frac{5+11}{2} = 8$$

$$x_2 = \frac{-(-5) - \sqrt{121}}{2 \cdot 1} = \frac{5-11}{2} = -3$$

2. $x^2 - 6x + 12 = 0$

$$\begin{aligned} A &= 1 \\ B &= -6 \\ C &= 12 \end{aligned}$$

$$\begin{aligned} D &= (-6)^2 - 4 \cdot 1 \cdot 12 \\ D &= 36 - 48 \end{aligned}$$

$$D = -12 \text{ þessi kann háltauast}$$

3. $x^2 - 3x - 18 = 0$

$$\begin{aligned} A &= 1 \\ B &= -3 \\ C &= -18 \end{aligned}$$

$$\begin{aligned} D &= (-3)^2 - 4 \cdot 1 \cdot (-18) \\ D &= 9 + 72 \\ D &= 81 \end{aligned}$$

$$x_1 = \frac{-(-3) + \sqrt{81}}{2 \cdot 1} = \frac{3+9}{2} = 6$$

$$x_2 = \frac{-(-3) - \sqrt{81}}{2 \cdot 1} = \frac{3-9}{2} = -3$$

4. $x^3 - 6x^2 - 12x = 0$

$$x(x^2 - 6x - 12) = 0$$

$$\begin{aligned} A &= 1 \\ B &= -6 \\ C &= -12 \end{aligned} \quad \begin{aligned} D &= (-6)^2 - 4 \cdot 1 \cdot (-12) \\ D &= 36 + 48 \\ D &= 84 \end{aligned}$$

$$x_1 = 0$$

$$x_2 = \frac{-(-6) + \sqrt{84}}{2 \cdot 1}$$

$$x_3 = \frac{-(-6) - \sqrt{84}}{2 \cdot 1}$$

5. $\sqrt{x+4} = x-4$

$$(\sqrt{x+4})^2 = (x-4)^2$$

$$x+4 = x^2 - 8x + 16$$

$$0 = x^2 - 7x + 10$$

$$\begin{aligned} A &= 1 \\ B &= -7 \\ C &= 10 \end{aligned} \quad \begin{aligned} D &= (-7)^2 - 4 \cdot 1 \cdot 10 \\ D &= 49 - 40 \\ D &= 9 \end{aligned}$$

$$x_1 = \frac{-(-7) + \sqrt{9}}{2 \cdot 1} = \frac{10}{2} = 5$$

$$x_2 = \frac{-(-7) - \sqrt{9}}{2 \cdot 1} = \frac{4}{2} = 2$$

6. $1 - 6x = 12x^2$

$1 - 6x - 12x^2 = 0$

$A = -12$

$B = -6$

$C = 1$

$D = (-6)^2 - 4(-12) \cdot 1$

$D = 36 + 48$

$D = 84$

$x_1 = \frac{-(-6) + \sqrt{84}}{2(-12)} = \frac{6 + 2\sqrt{21}}{-24} =$

$x_2 = \frac{-(-6) - \sqrt{84}}{2(-12)} = \frac{6 - 2\sqrt{21}}{-24} =$

$x_1 = \frac{2(3 + \sqrt{21})}{-24} = -\frac{(3 + \sqrt{21})}{12} = \frac{-3 - \sqrt{21}}{12}$

$x_2 = \frac{2(3 - \sqrt{21})}{-24} = -\frac{(3 - \sqrt{21})}{12} = \frac{-3 + \sqrt{21}}{12}$

7. Skiptu tölunni 57 í tvennt þannig að margfeldi talnanna verði 616,25. Búðu til jöfnur og leystu þær.

$57 = x + y$

$616,25 = x \cdot y$

$y = 57 - x$

$616,25 = x(57 - x)$

$616,25 = 57x - x^2$

$x^2 - 57x + 616,25 = 0$

$A = 1$

$B = -57$

$C = 616,25$

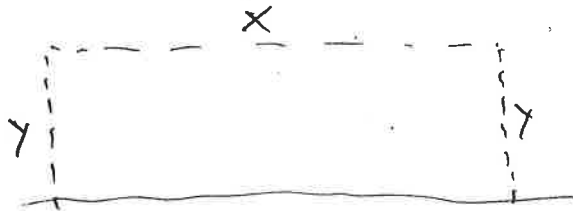
$D = (-57)^2 - 4 \cdot 1 \cdot 616,25$

$D = 784$

$x_1 = \frac{-(-57) + \sqrt{784}}{2 \cdot 1} = \frac{57 + 28}{2} = 42,5$

$x_2 = \frac{-(-57) - \sqrt{784}}{2 \cdot 1} = \frac{57 - 28}{2} = 14,5$

8. Réthyrnt landssvæði stendur við á og er afgirt á þrjá vegu (ekki meðfram ánni). Flatamál þess er 288 m^2 og samtals er lengd girðingarinnar 50 m. Finndu lengd og breidd. Búðu til jöfnur og leystu þær.



Skiladagur. Fimmtudagur 9. mars

$x \cdot y = 288$

$x = 50 - 2y$

$x + 2y = 50$

$(50 - 2y) \cdot y = 288$

$50y - 2y^2 = 288$

$-2y^2 + 50y - 288 = 0$

$A = -2$

$B = 50$

$C = -288$

$D = 50^2 - 4(-2)(-288)$

$D = 2500 - 2304$

$D = 196$

~~$x_1 = \frac{-50 + \sqrt{196}}{2(-2)} = \frac{-50 + 14}{-4} = \frac{-36}{-4} = 9$~~

~~$x_2 = \frac{-50 - \sqrt{196}}{2(-2)} = \frac{-50 - 14}{-4} = \frac{-64}{-4} = 16$~~

ef $y = 9$ þá er $x = 32$

ef $y = 16$ þá er $x = 18$