Másodfokú egyenlőtlenség

(1) $2x^2 - 5x - 12 = 0$

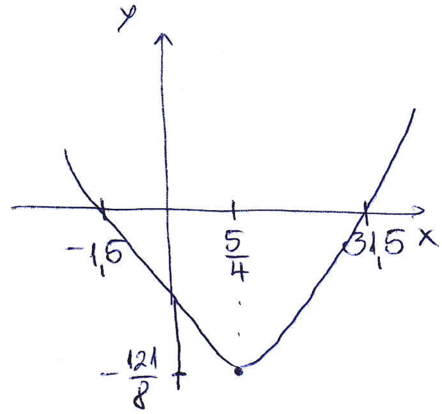
$2x^2 - 5x - 12 = 2\left[x^2 - \frac{5}{2}x\right] - 12 = 2\left[\left(x - \frac{5}{4}\right)^2 - \frac{25}{16}\right] - 12 =$

$= 2\left(x - \frac{5}{4}\right)^2 - \frac{25}{8} - \frac{96}{8} = 2\left(x - \frac{5}{4}\right)^2 - \frac{121}{8}$

szélsőértékhely: $x = \frac{5}{4}$

szélsőérték: $-\frac{121}{8}$

gyökök (zérushelyek)



$2x^2 - 5x - 12 = 0$

$x_{1,2} = \frac{5 \pm \sqrt{25 + 96}}{4} = \frac{5 \pm 11}{4} = \begin{cases} \nearrow 31,5 \\ \searrow -1,5 \end{cases}$

(2) $\sqrt{x+2} = x - 4$ feltétel: $x + 2 \geq 0$ és $x - 4 \geq 0$ $\left.\begin{matrix} x \geq -2 & x \geq 4 \end{matrix}\right\}$ $x \geq 4$

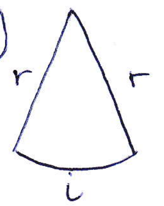
$x + 2 = (x-4)^2$

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

$x^2 - 9x + 14 = 0$

$x_{1,2} = \frac{9 \pm \sqrt{81 - 56}}{2} = \frac{9 \pm 5}{2}$ $\nearrow 7$, $\searrow 2$ hamis

(3)



$t = \frac{i \cdot r}{2}$ K: $2r + i = 2r + \frac{2t}{r} = 80$

$2r^2 + 2t = 80r$

$r^2 + t = 40r$

$r^2 - 40r + t = 0$

$(r - 20)^2 - 400 + t = 0$

$\rightarrow$ szélsőértékhely: $r = 20$

④ $$\frac{2x^2+3x-5}{2x^2+11x+15} = \frac{(x-1)\left(x+\frac{10}{4}\right)}{(x+3)\left(x+\frac{10}{4}\right)} = \frac{x-1}{x+3}$$

$$2x^2+3x-5 \Rightarrow \quad x_{1,2} = \frac{-3\pm\sqrt{9+40}}{4} = \frac{-3\pm 7}{4} \begin{array}{l} \nearrow 1 \\ \searrow -\frac{10}{4} \end{array}$$

$$2x^2+11x+15 \rightarrow \quad x_{1,2} = \frac{-11\pm\sqrt{121-120}}{4} = \frac{-11\pm 1}{4} \begin{array}{l} \nearrow -\frac{10}{4} \\ \searrow -3 \end{array}$$

⑤ $$\frac{x+2}{x-3} \le 0 \qquad F:\ x-3 \ne 0$$
$$x \ne 3$$

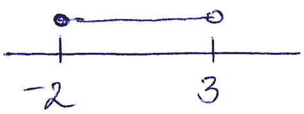
$\cancel{x+2 \le x-3}$

⑤ $$\frac{x+2}{x-3} \le 0 \qquad F:\ x-3 \ne 0$$
$$x \ne 3$$

a) $\frac{+}{-}$

$x+2 \ge 0 \qquad x-3<0$

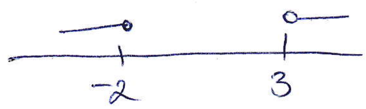
$x \ge -2 \qquad x<3$



b) $\frac{-}{+}$

$x+2 \le 0$ és $x-3>0$

$x \le -2 \qquad x>3$



nincs megoldás