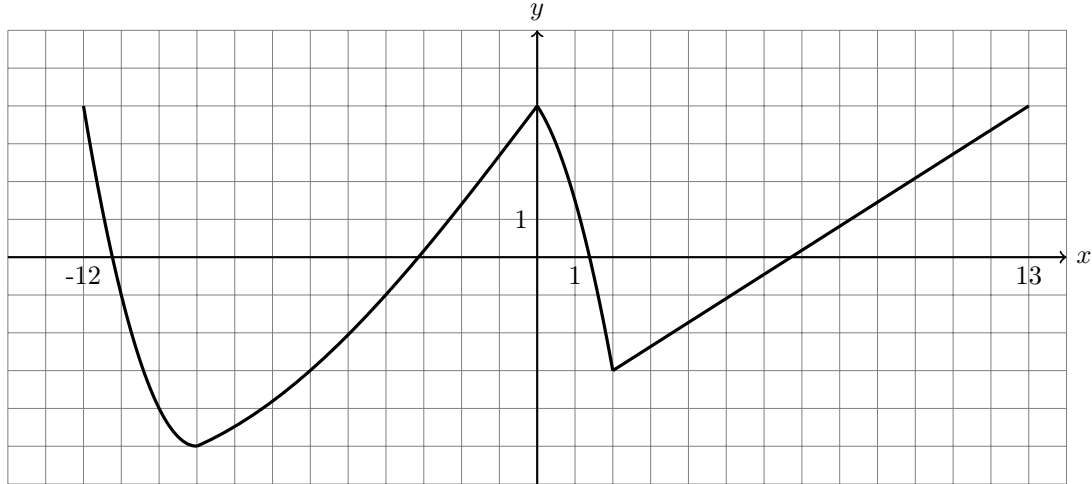


Függvények elemzése

1. A valós számok halmazán értelmezett $x \mapsto -(x-1)^2 + 4$ függvénynek minimuma vagy maximuma van? Adja meg a szélsőérték helyét és értékét!

maximum, helye $x = 1$, értéke 4

2. Adjon meg egy olyan zárt intervallumot, ahol a grafikonjával megadott alábbi függvény csökkenő!



$[-1; 1]$

3. Adja meg a $[-2; 3]$ intervallumon értelmezett $f(x) = x^2 + 1$ függvény értékkészletét!

$[1; 10]$

4. Adja meg a valós számok halmazán értelmezett $x \mapsto x^2 - 5x$ másodfokú függvény zérushelyeit! Számítsa ki a függvény helyettesítési értékét az 1,2 helyen!

$x_1 = 0, x_2 = 5, f(1) = -4, f(2) = -6$

5. Mennyi az $f(x) = -|x| + 10$ ($x \in \mathbb{R}$) függvény legnagyobb értéke, és hol veszi fel ezt az értéket?

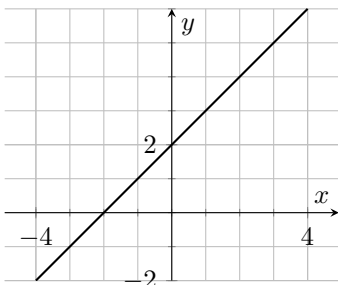
értéke 10, helye 0

6. Fogalmazza meg, hogy az $f: \mathbb{R} \rightarrow \mathbb{R}, f(x) = |x+2| - 1$ függvény grafikonja milyen transzformációkból származtatható az $f_0: \mathbb{R} \rightarrow \mathbb{R}, f_0(x) = |x|$ függvény grafikonjából! Ábrázolja az f függvényt a $[-6; 6]$ intervallumon!

lefele tolni 1-gyel, balra 2-vel

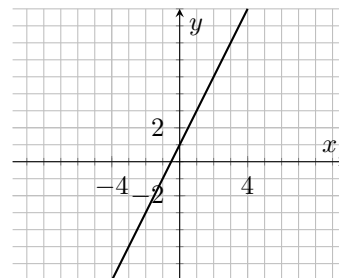
7. Add meg a grafikonok alapján a függvények hozzárendelési szabályát!

a)



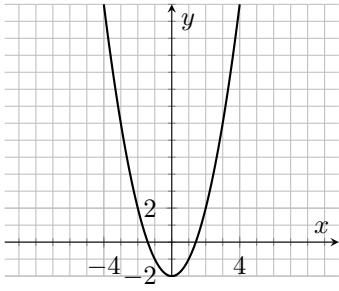
$2 + x \leftarrow x$

b)



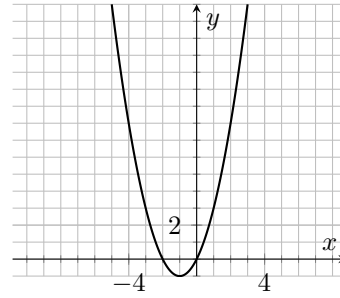
$x \leftarrow 2x + 1$

c)



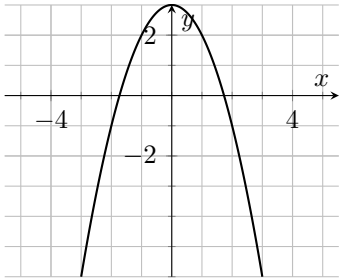
$$\zeta - \zeta x \leftrightarrow x$$

d)



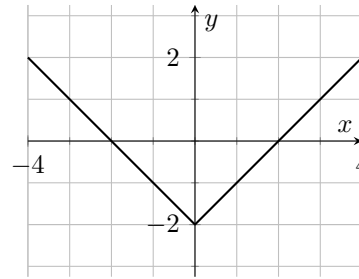
$$\Gamma - \zeta(\Gamma + x) \leftrightarrow x$$

e)



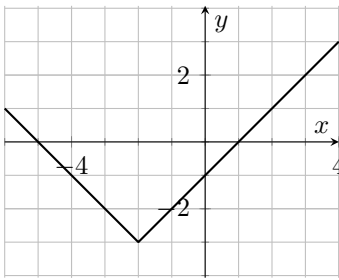
$$\xi + \zeta x \leftrightarrow x$$

f)



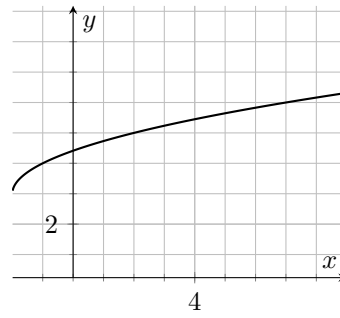
$$\zeta - |x| \leftrightarrow x$$

g)



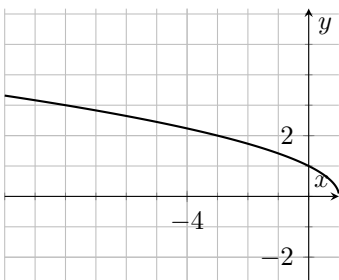
$$\xi - |\zeta + x| \leftrightarrow x$$

h)



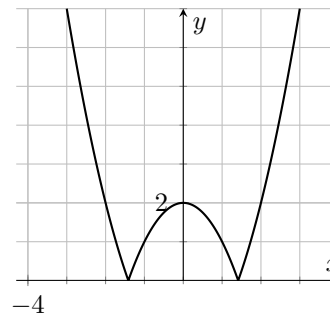
$$\xi + \zeta + x^\wedge \leftrightarrow x$$

i)



$$\Gamma + x - \wedge \leftrightarrow x$$

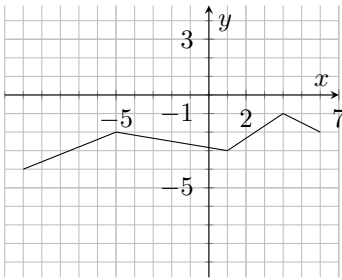
j)



$$|\zeta - \zeta x| \leftrightarrow x$$

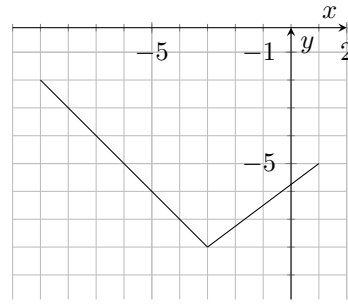
8. Határozd meg az alábbi, grafikonjukkal megadott függvények értékkészletét, szélsőértékeinek helyét, értékét!

a)



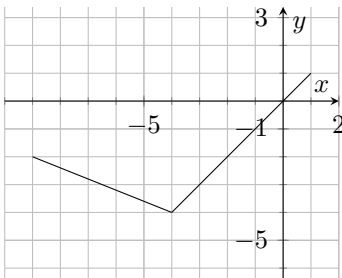
E.K.: [-4; -1]
 (-10; -4);
 (-5; -2); (1; -3);
 (4; -1); (9; -2);

b)



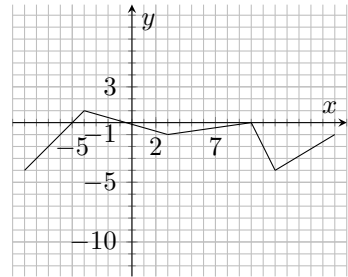
E.K.: [-8; -2]
 (-9; -2);
 (-3; -8);
 (1; -5);

c)



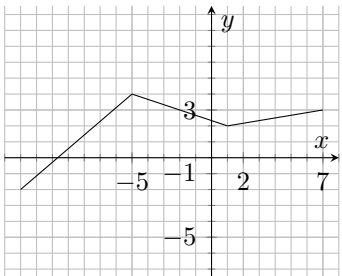
E.K.: [-4; 1]
 (-9; -2);
 (-4; -4);
 (1; 1);

d)



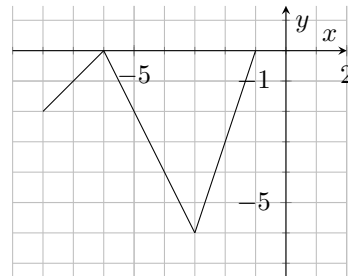
E.K.: [-4; 1]
 (-9; -4); (-4; 1);
 (3; -1); (10; 0);
 (12; -4); (17; -1);

e)



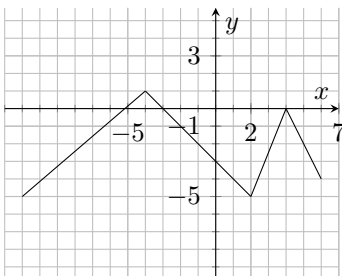
E.K.: [-2; 4]
 (-12; -2);
 (-5; 4);
 (1; 2); (7; 3);

f)



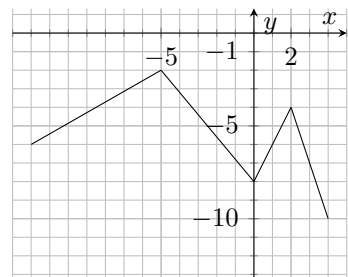
E.K.: [-6; 0]
 (-8; -2);
 (-6; 0);
 (-3; -6); (-1; 0);

g)



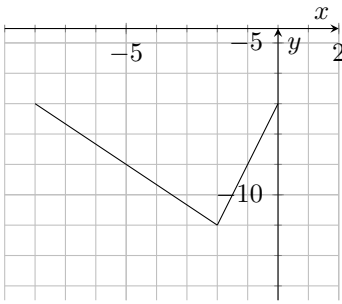
E.K.: [-5; 1]
 (-11; -5);
 (-4; 1); (2; -5);
 (4; 0); (6; -4);

h)



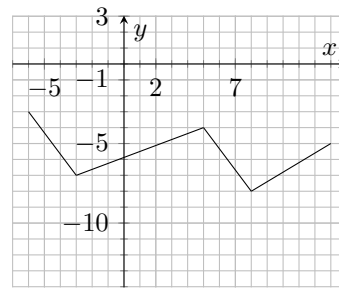
E.K.: [-10; -2]
 (-12; -6);
 (-5; -2); (0; -8);
 (2; -4); (4; -10);

i)



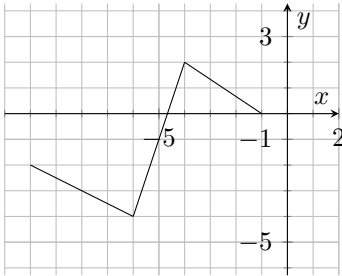
E.K.: [-11; -7]
 (-8; -7);
 (-2; -11);
 (0; -7);

j)



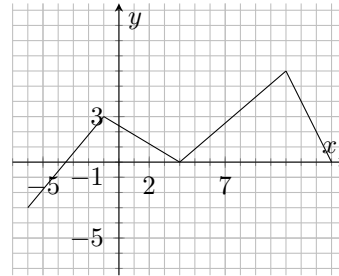
E.K.: [-8; -3]
 (-6; -3);
 (-3; -7); (5; -4);
 (8; -8); (13; -5);

k)



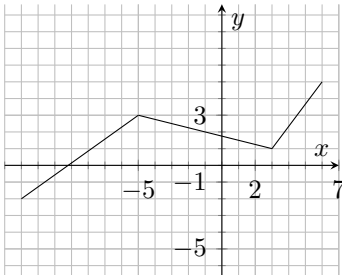
E.K.: [-4; 2]
 (-10; -2);
 (-6; -4);
 (-4; 2); (-1; 0);

l)



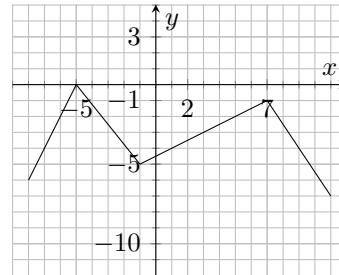
E.K.: [-3; 6]
 (-6; -3);
 (-1; 3); (4; 0);
 (11; 6); (14; 0);

m)



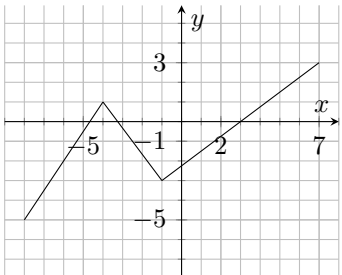
E.K.: [-2; 5]
 (-12; -2);
 (-5; 3);
 (3; 1); (6; 5);

n)



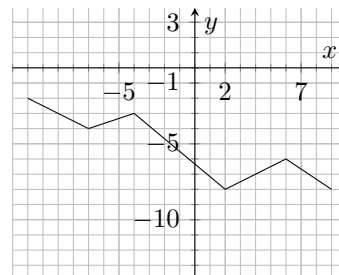
E.K.: [-7; 0]
 (-8; -6);
 (-5; 0); (-1; -5);
 (7; -1); (11; -7);

o)



E.K.: [-5; 3]
 (-8; -5);
 (-4; 1);
 (-1; -3); (7; 3);

p)



E.K.: [-8; -2]
 (-11; -2); (-7; -4);
 (-4; -3); (2; -8);
 (6; -6); (9; -8);