UČNI LIST – Racionalna funkcija – 1

1) Izračunaj ničle racionalne funkcije:

a) $f(x)=\dfrac{x^2-2x-8}{x^2-6x+5}$

b) $f(x)=\dfrac{x^2+8x+16}{-x+6}$

c) $f(x)=\dfrac{12x^3+8x^2-3x-2}{2x^2+4x+8}$

2) Izračunaj pole racionalne funkcije:

a) $f(x)=\dfrac{2x^2-4x-6}{x^2+x-12}$

b) $f(x)=\dfrac{x^2+x-2}{x-2}$

c) $f(x)=\dfrac{2x^2-6}{2x^3-15x^2+36x-27}$

3) Izračunaj in nariši asimptotično krivuljo rac. funkcije (označi še presečišče z asimp. krivuljo):

a) $f(x)=\dfrac{8x-3}{2x+5}$

b) $f(x)=\dfrac{x^2-5x-6}{-x^2-2x+8}$

c) $f(x)=\dfrac{x^2-3x-4}{x+2}$

d) $f(x)=\dfrac{6x^4+x^3+22x^2+5x-12}{2x^3-x^2+8x-4}$

4) Izračunaj ničle, pole, asimptotično krivuljo in presečišče z asimp. krivuljo racionalne funkcije:

a) $f(x)=\dfrac{4x+3}{-2x+6}$

b) $f(x)=\dfrac{x^2-3x+2}{x^2-2x-3}$

c) $f(x)=\dfrac{x^2+x-12}{x^2-4}$

d) $f(x)=\dfrac{x^3+2x^2-5x-6}{x^2+x-2}$

e) $f(x)=\dfrac{3x-5}{x^2+6x+9}$

f) $f(x)=\dfrac{x^3+2x^2-13x+10}{x^2-x-2}$

5) Nariši graf racionalne funkcije:

a) $f(x)=\dfrac{x-2}{x+4}$

b) $f(x)=\dfrac{3x+7}{-x+2}$

c) $f(x)=\dfrac{x}{x+1}$

d) $f(x)=\dfrac{-2x-5}{x}$

6) Nariši graf racionalne funkcije:

a) $f(x)=\dfrac{x^2+x-6}{x^2-2x-8}$

b) $f(x)=\dfrac{x^2-4x-5}{-x^2+4}$

c) $f(x)=\dfrac{x-2}{x^2-x-6}$

d) $f(x)=\dfrac{x^2-3x+2}{x^2+4x+3}$

7) Nariši graf racionalne funkcije:

a) $f(x)=\dfrac{3x^2+6x-24}{x^2-2x-3}$

b) $f(x)=\dfrac{x^2-7x+10}{x^2-2x-8}$

c) $f(x)=\dfrac{2x^2-6x-8}{x^2+x-6}$

d) $f(x)=\dfrac{2x-3}{x^2+4x}$

8) Nariši graf racionalne funkcije:

a) $f(x)=\dfrac{x^2-3x-4}{x^2+2x-3}$

b) $f(x)=\dfrac{x^2-4x+4}{x^2-4x-5}$

c) $f(x)=\dfrac{x^2-2x}{-x^2+x+6}$

d) $f(x)=\dfrac{x^2-4x-5}{x^2-2x+1}$

9) Nariši graf racionalne funkcije:

a) $f(x)=\dfrac{-x^2+3x+4}{x^2-x-6}$

b) $f(x)=\dfrac{x^2+4x+4}{x^2+4x-5}$

c) $f(x)=\dfrac{x^2-6x+9}{-x^2-x+2}$

d) $f(x)=\dfrac{5x+10}{-x^2+1}$

10) Nariši graf racionalne funkcije:

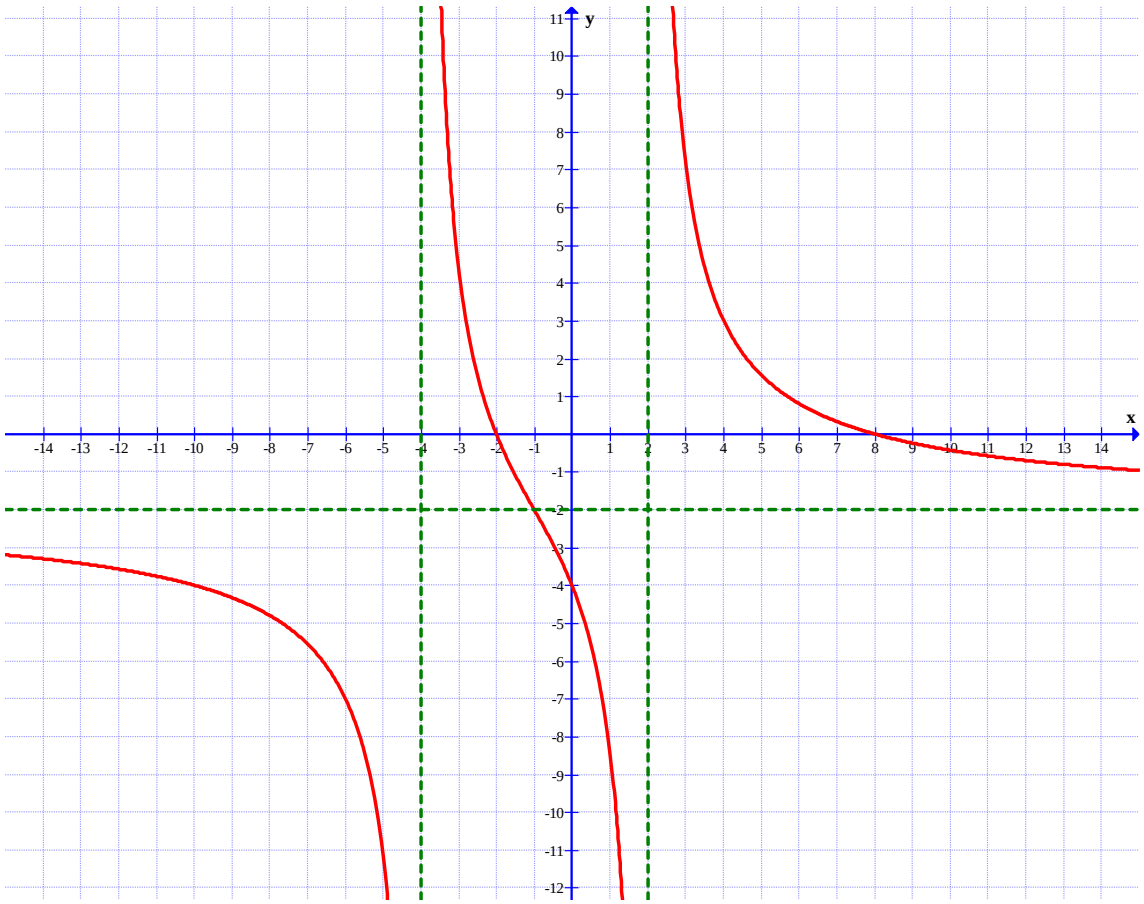
a) $f(x)=\dfrac{-x^2+4x-4}{x^2+3x}$

b) $f(x)=\dfrac{x^2+7x+12}{x^2-x-6}$

c) $f(x)=\dfrac{2x^2-8}{x^2-2x-15}$

d) $f(x)=\dfrac{x^2+2x+1}{x^2-6x+9}$

11) V koordinatnem sistemu je narisan graf neke racionalne funkcije:



a) Ugotovi in zapiši presečišča funkcije s koordinatnimi osmi.
b) Zapiši enačbe vseh asimtot te racionalne funkcije.
c) Izračunaj vrednost izraza $f(4)-2\cdot f(-6)$.

REŠITVE UČNEGA LISTA – Racionalna funkcija – 1

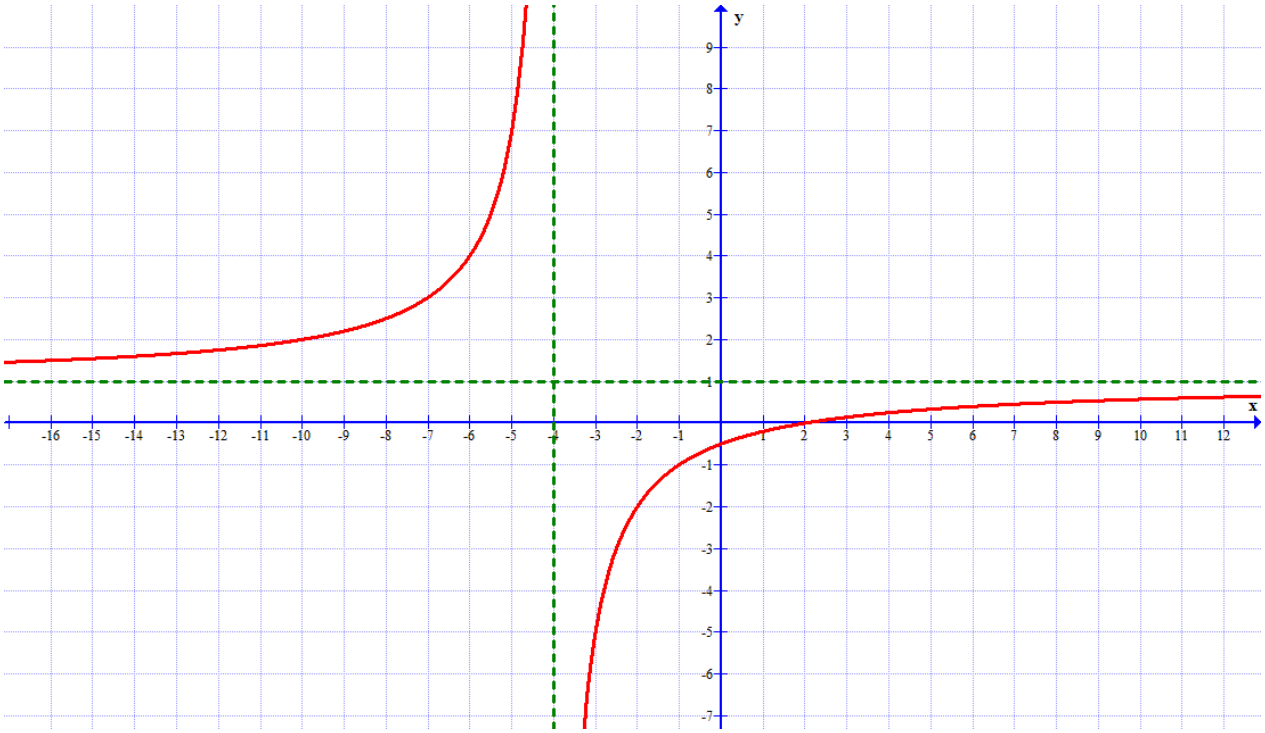
1) a) $N: x_1 = -2,\ x_2 = 4$
   b) $N: x_{1,2} = -4$
   c) $N: x_1 = -\frac{2}{3},\ x_2 = -\frac{1}{2},\ x_3 = \frac{1}{2}$

2) a) $P: x_1 = -4,\ x_2 = 3$
   b) $P: x_1 = 2$
   c) $P: x_{1,2} = 3,\ x_3 = \frac{3}{2}$

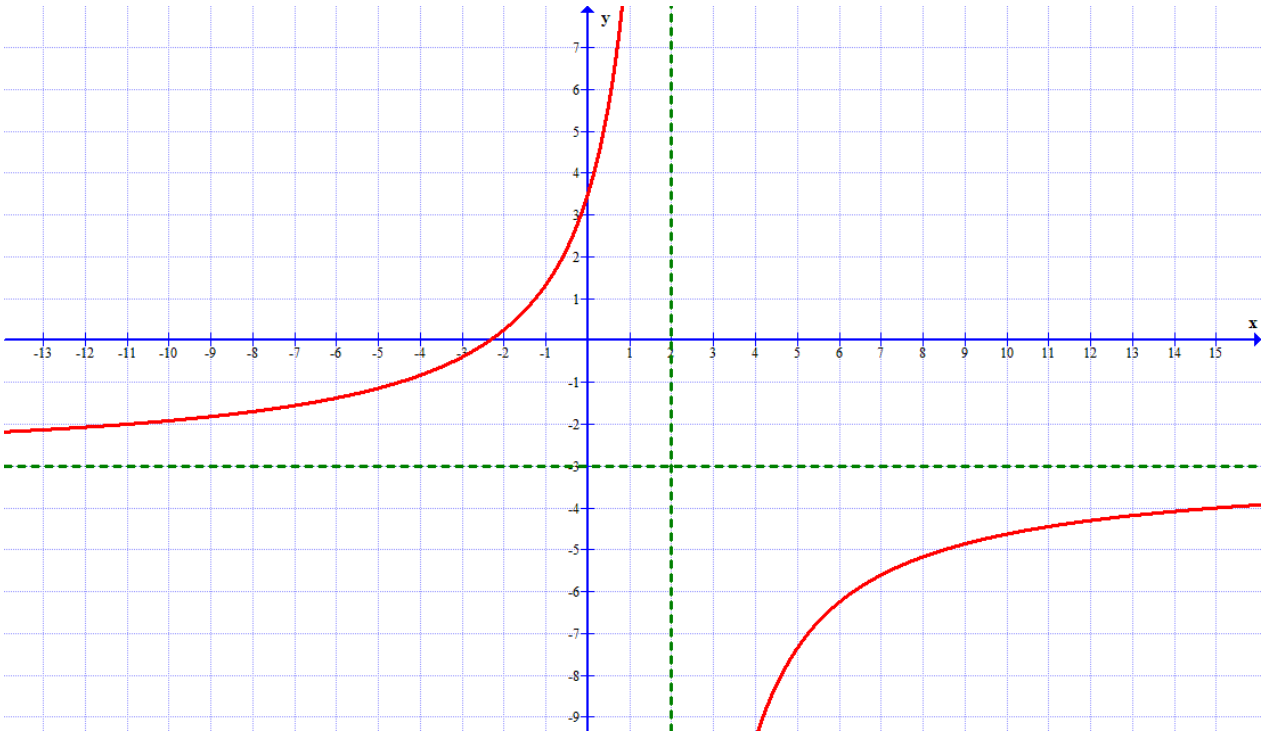
3) a) $Ak: y = 4;\ P_{Ak}: \varnothing$
   b) $Ak: y = -1;\ P_{Ak}: x = \frac{2}{7}$
   c) $Ak: y = x - 5;\ P_{Ak}: \varnothing$
   d) $Ak: y = 3x + 2;\ P_{Ak}: x = 4$

4) a) $N: x = -\frac{3}{4};\ P: x = 3;\ Ak: y = -2;\ P_{Ak}: \varnothing$
   b) $N: x_1 = 1,\ x_2 = 2;\ P: x_1 = -1,\ x_2 = 3;\ Ak: y = 1;\ P_{Ak}: x = 5$
   c) $N: x_1 = -4,\ x_2 = 3;\ P: x_1 = -2,\ x_2 = 2;\ Ak: y = 1;\ P_{Ak}: x = 8$
   d) $N: x_1 = -3,\ x_2 = -1,\ x_3 = 2;\ P: x_1 = -2,\ x_2 = 1;\ Ak: y = x + 1;\ P_{Ak}: x = -1$
   e) $N: x = \frac{5}{3};\ P: x_{1,2} = -3;\ Ak: y = 0;\ P_{Ak}: x = \frac{5}{3}$
   f) Ulomek se krajša z $(x-2)$ in ostane funkcija $f(x) = \dfrac{x^2 + 4x - 5}{x + 1}$!
   $N: x_1 = -5,\ x_2 = 1;\ P: x_1 = -1;\ Ak: y = x + 3;\ P_{Ak}: \varnothing$

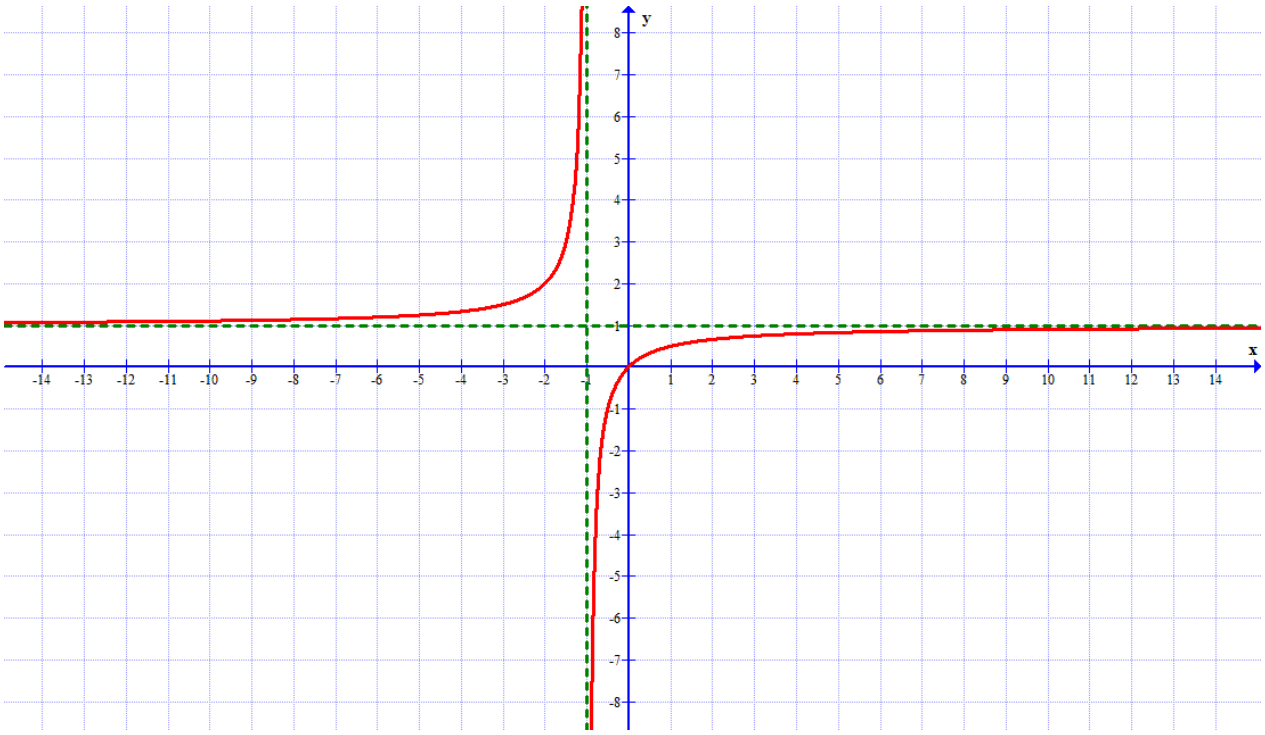
5) a) $N: x = 2;\ P: x = -4;\ Ak: y = 1;\ P_{Ak}: \varnothing$



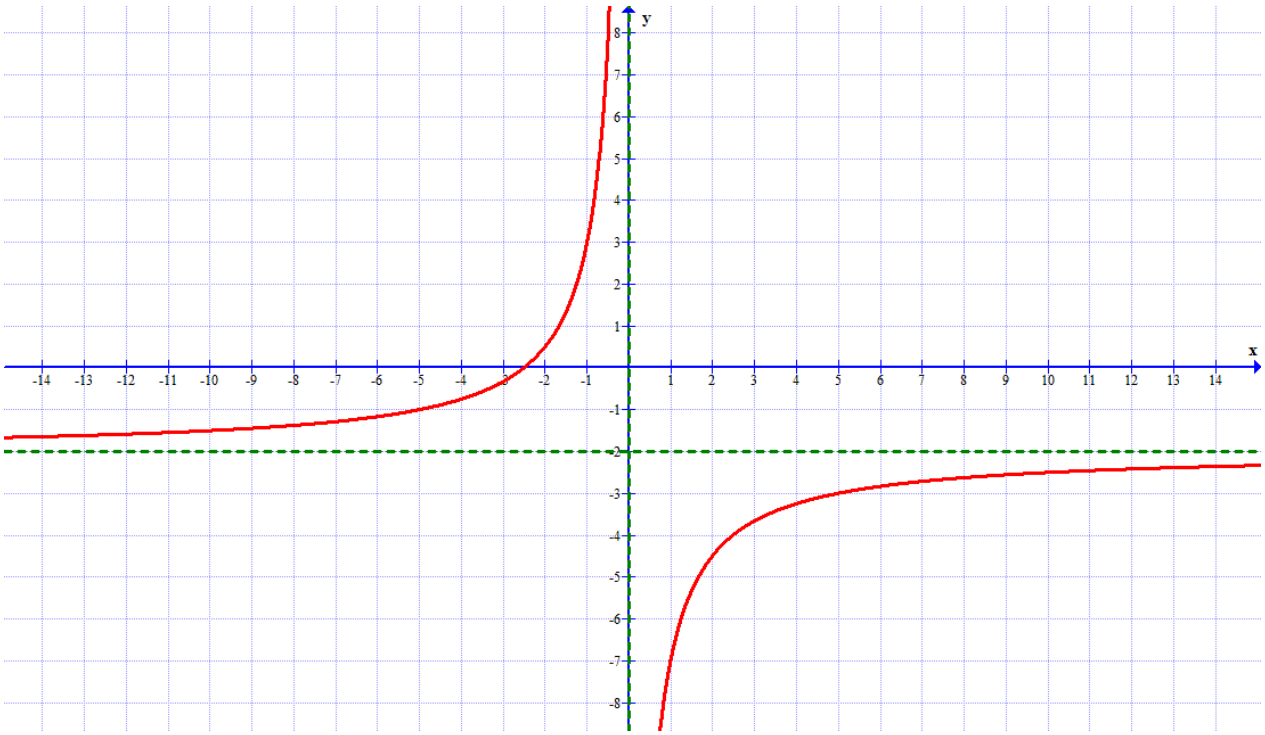
b) $N: x=-\frac{7}{3}; P: x=2; Ak: y=-3; P_{Ak}: \varnothing$



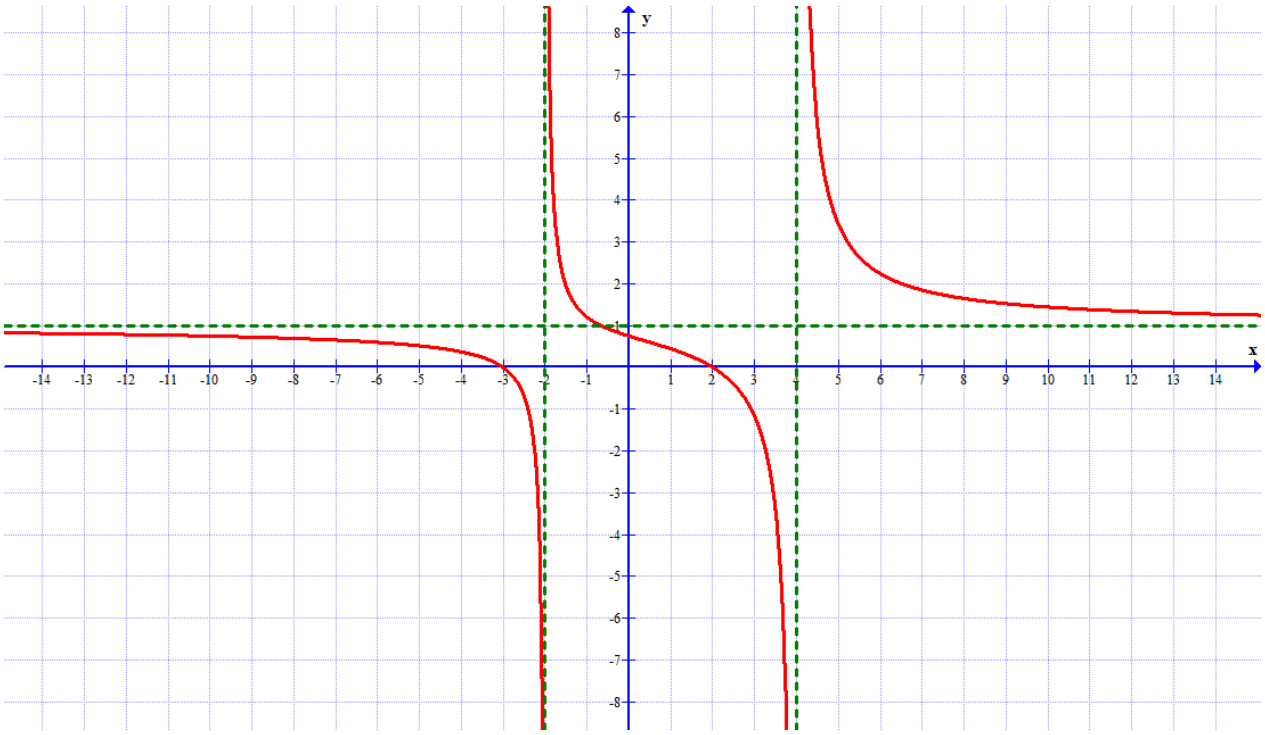
c) $N: x=0; P: x=-1; Ak: y=1; P_{Ak}: \varnothing$



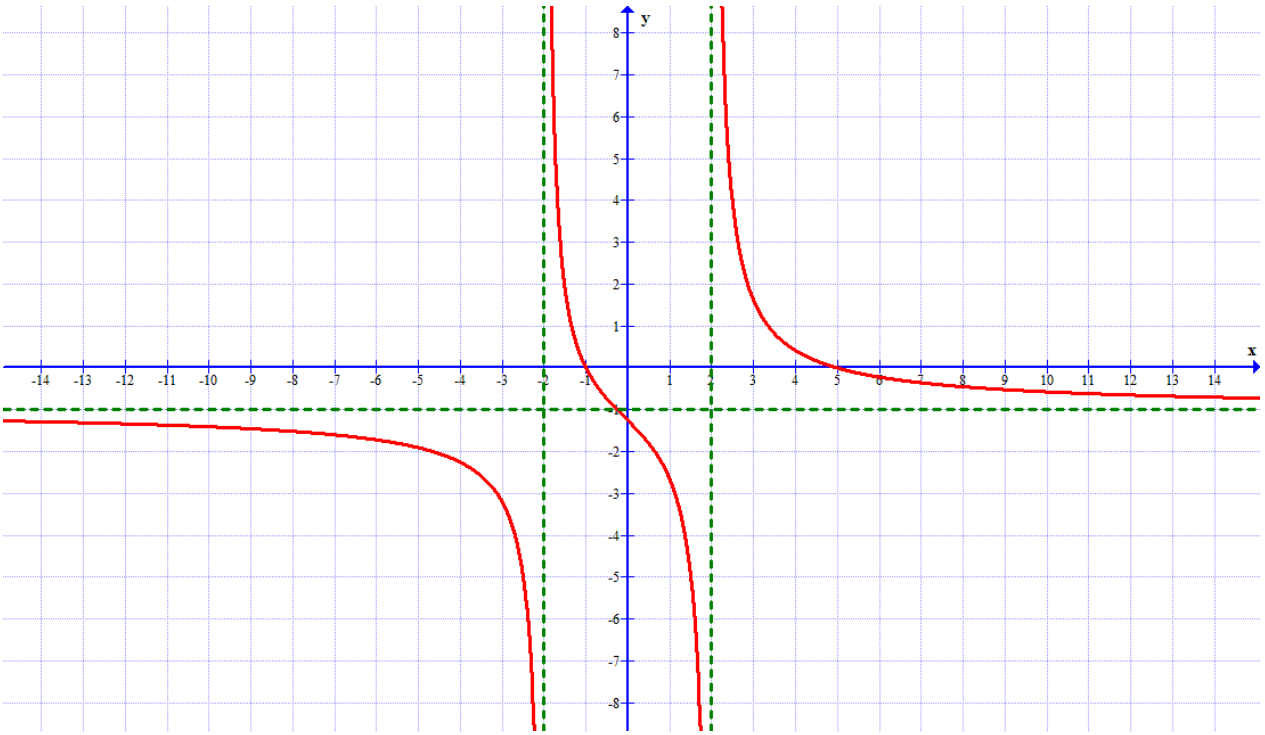
d) $f(x)=\dfrac{-2x-5}{x}$ $N:\ x=-\frac{5}{2};\ P:\ x=0;\ Ak:\ y=-2;\ P_{Ak}:\ \varnothing$



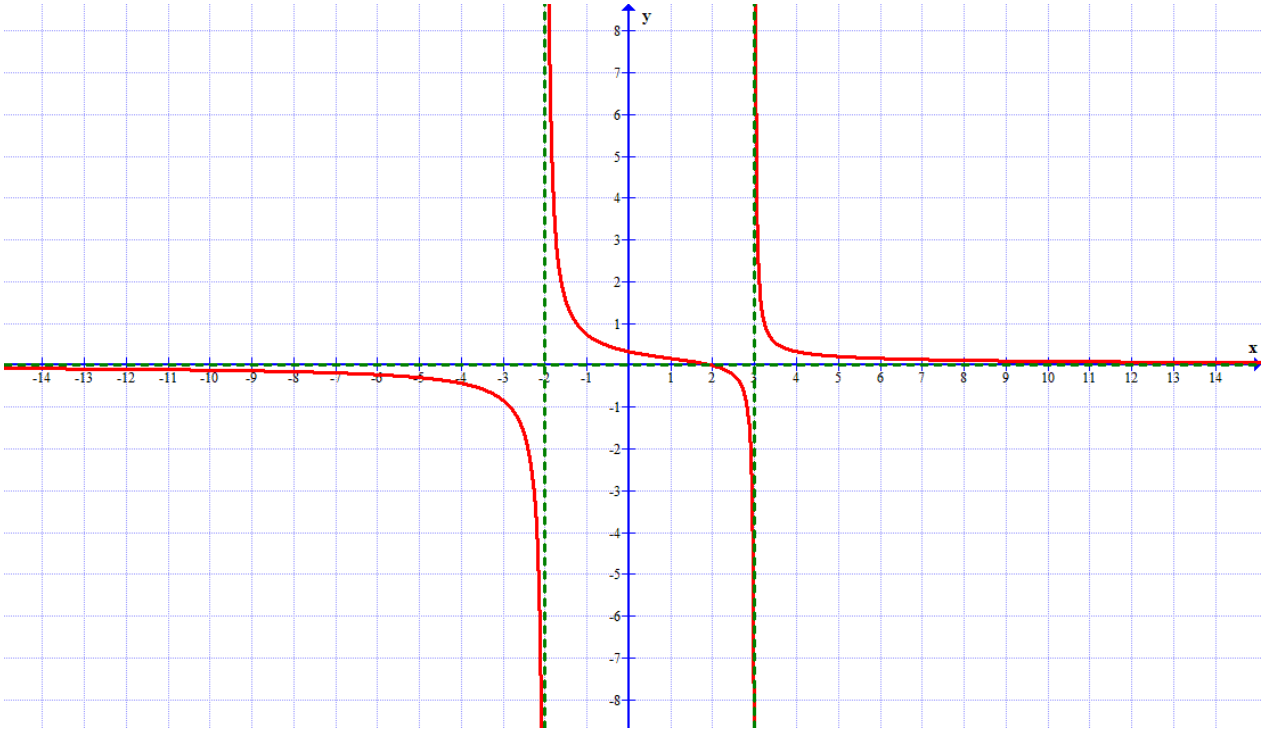
6) a) $N:\ x_1=-3,\ x_2=2;\ P:\ x_1=-2,\ x_2=4;\ Ak:\ y=1;\ P_{Ak}:\ x=-\frac{2}{3}$



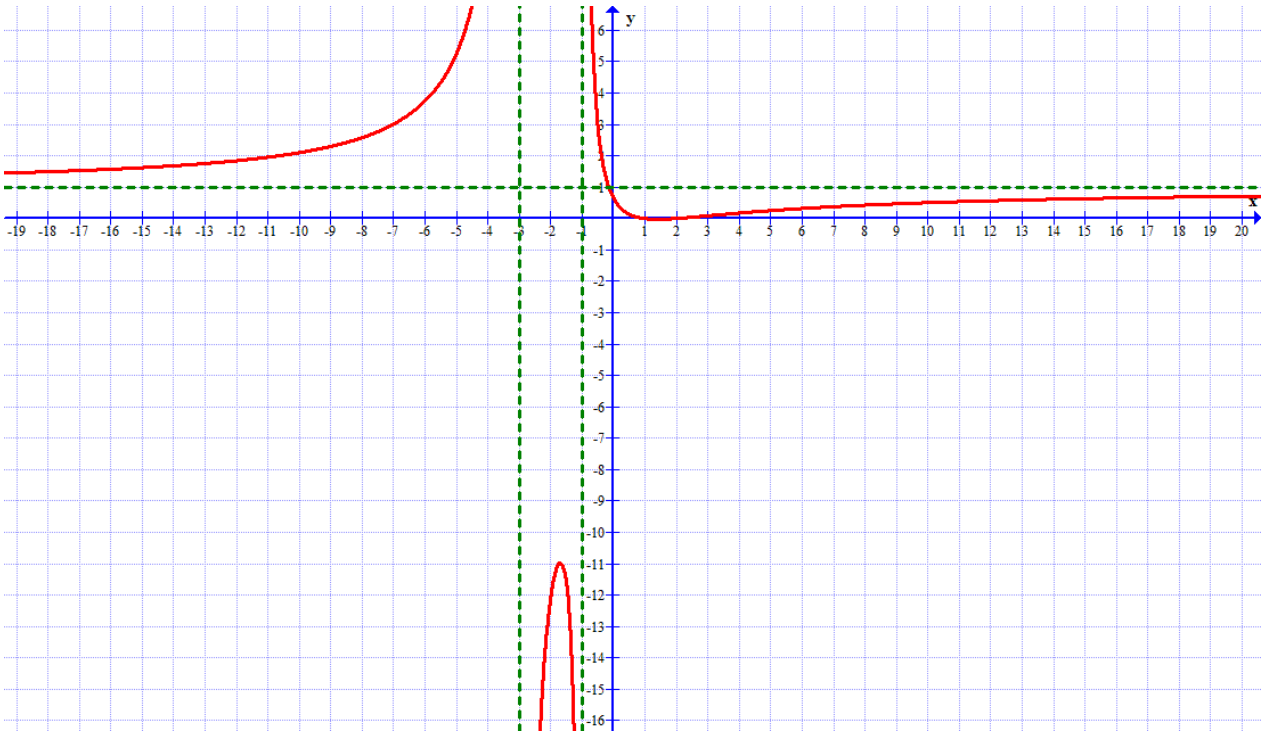
b) $N: x_1 = -1,\ x_2 = 5;\ P: x_1 = -2,\ x_2 = 2;\ Ak: y = -1;\ P_{Ak}: x = -\frac{1}{4}$



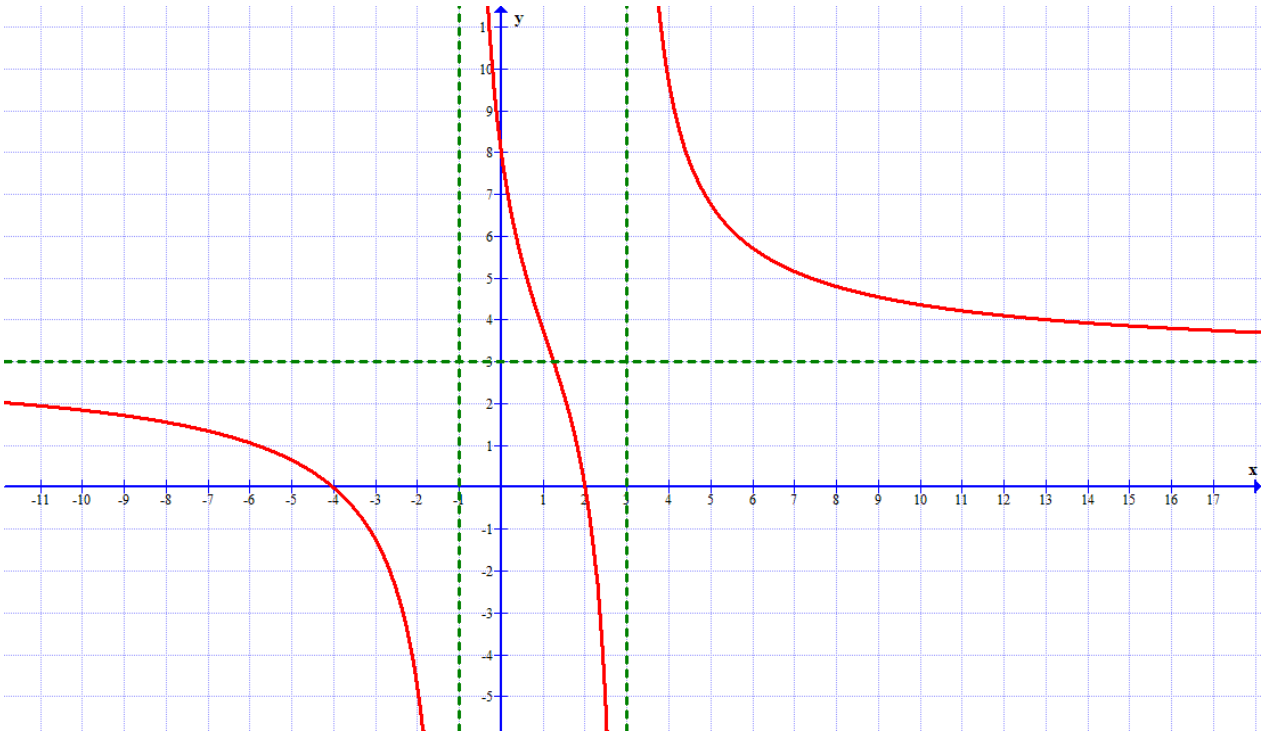
c) $N: x = 2;\ P: x_1 = -2,\ x_2 = 3;\ Ak: y = 0;\ P_{Ak}: x = 2$



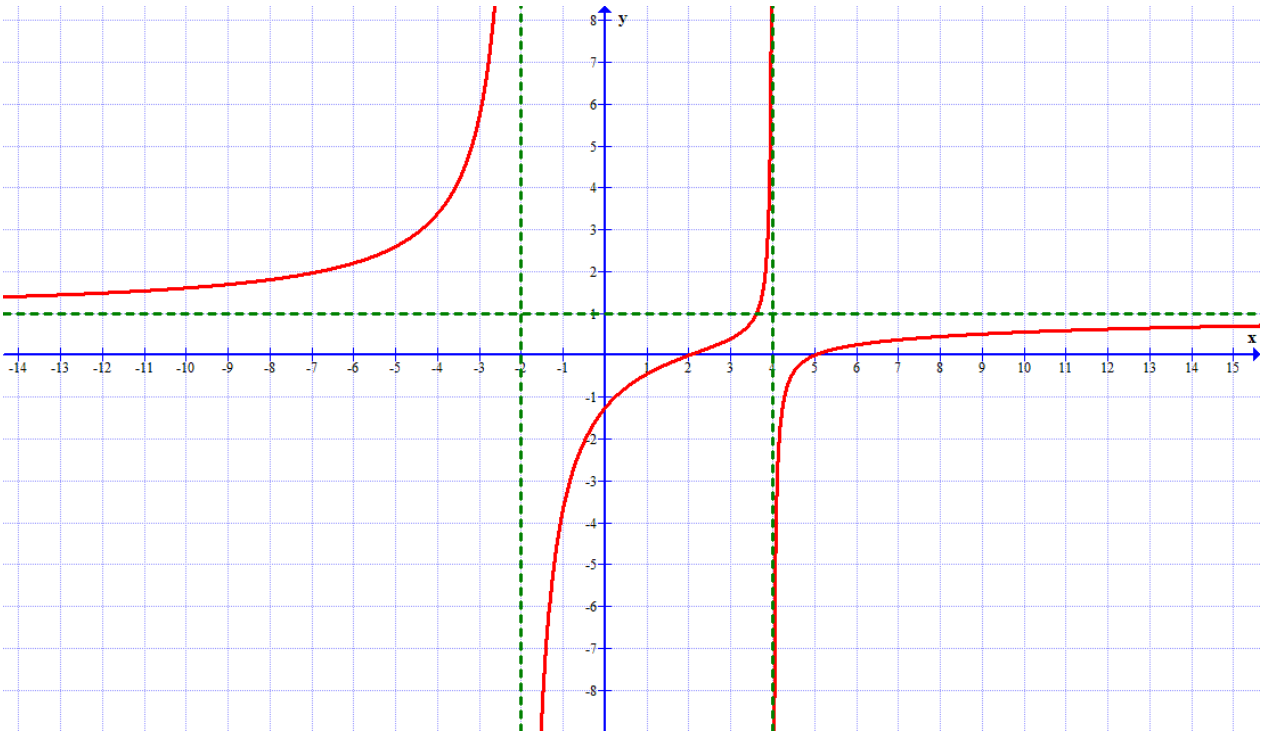
d) $N: x_1 = 1,\ x_2 = 2;\ P: x_1 = -3,\ x_2 = -1;\ Ak: y = 1;\ P_{Ak}: x = -\frac{1}{7}$



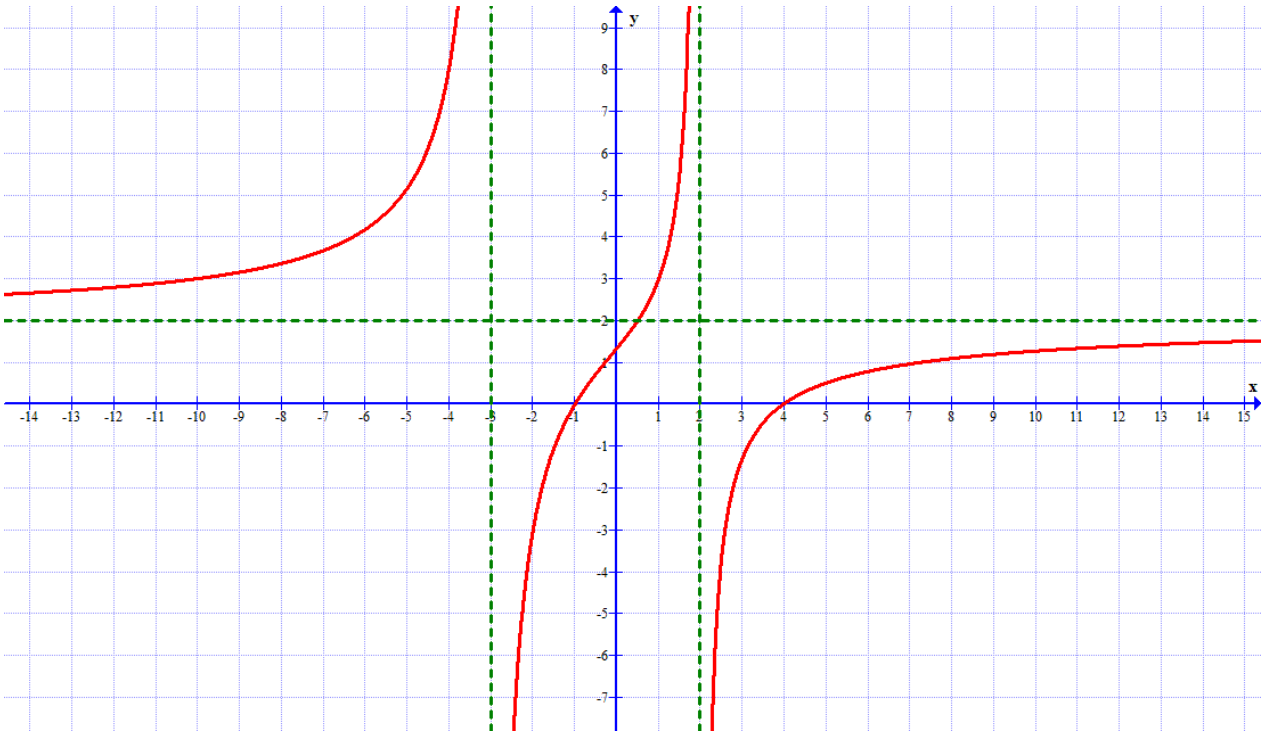
7) a) $N: x_1 = -4,\ x_2 = 2;\ P: x_1 = -1,\ x_2 = 3;\ Ak: y = 3;\ P_{Ak}: x = \frac{5}{4}$



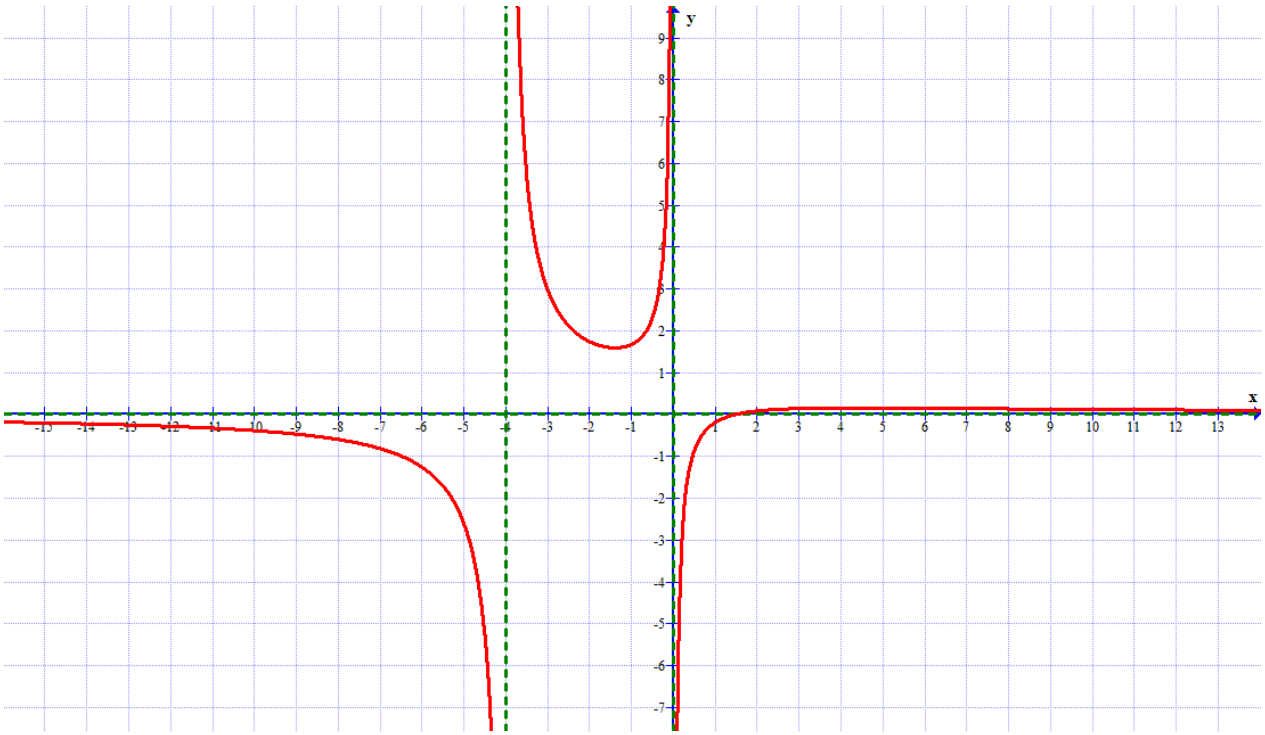
b) $N: x_1 = 2,\ x_2 = 5;\ P: x_1 = -2,\ x_2 = 4;\ Ak: y = 1;\ P_{Ak}: x = \frac{18}{5}$



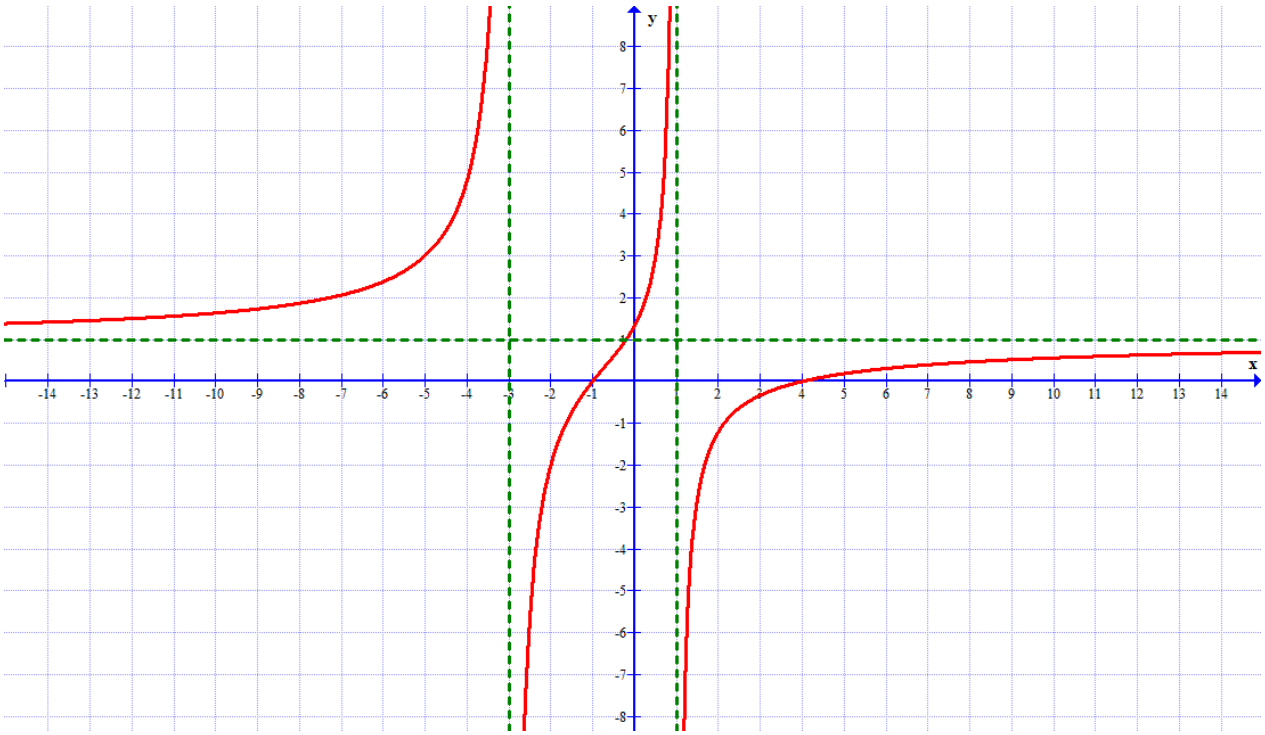
c) $N: x_1 = -1,\ x_2 = 4;\ P: x_1 = -3,\ x_2 = 2;\ Ak: y = 2;\ P_{Ak}: x = \frac{1}{2}$



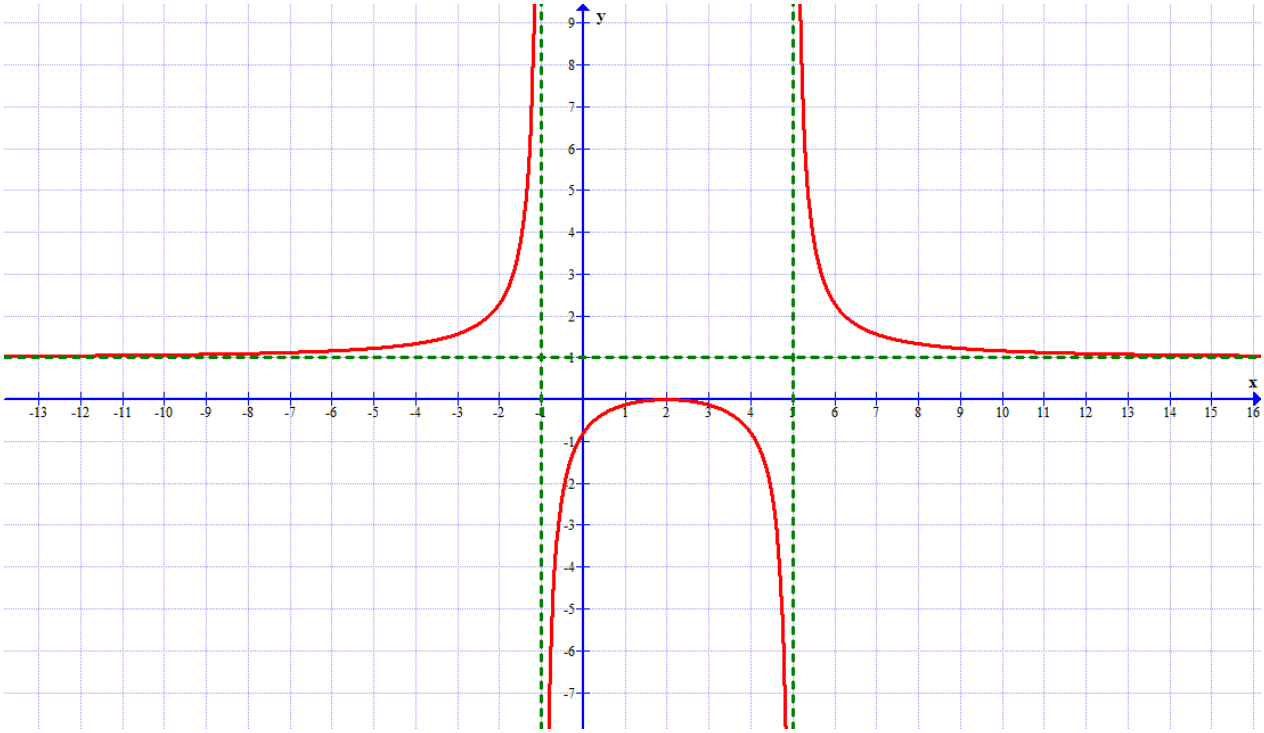
d) $N: x=\frac{3}{2};\ P: x_1=-4,\ x_2=0;\ Ak: y=0;\ P_{Ak}: x=\frac{3}{2}$



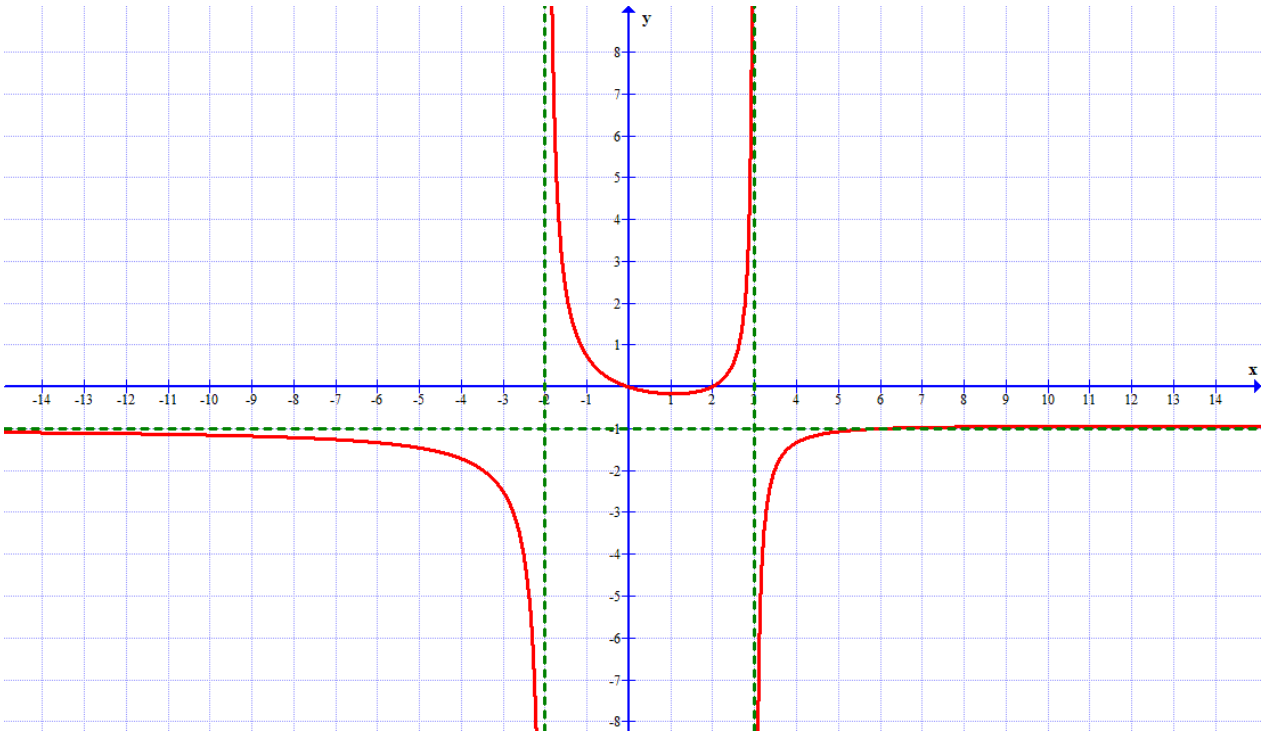
8) a) $N: x_1=-1,\ x_2=4;\ P: x_1=-3,\ x_2=1;\ Ak: y=1;\ P_{Ak}: x=-\frac{1}{5}$



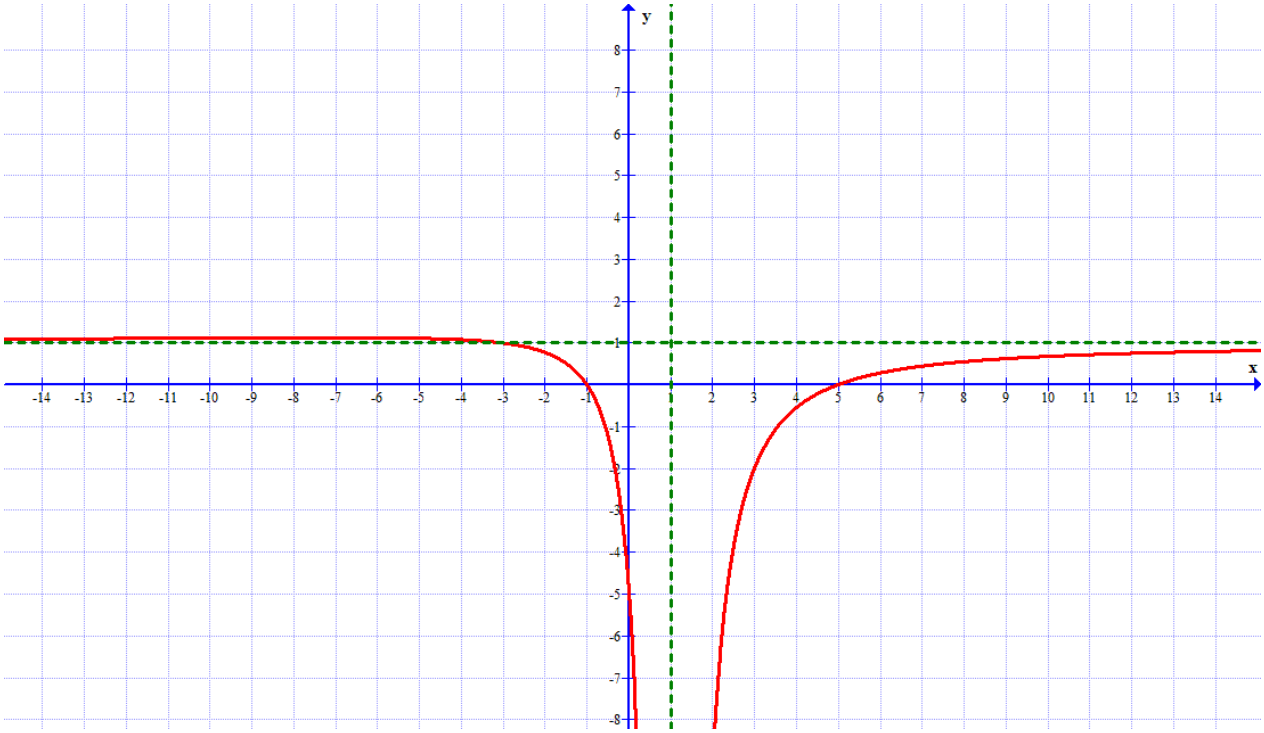
b) $N: x_{1,2}=2;\ P: x_1=-1,\ x_2=5;\ Ak: y=1;\ P_{Ak}: \varnothing$



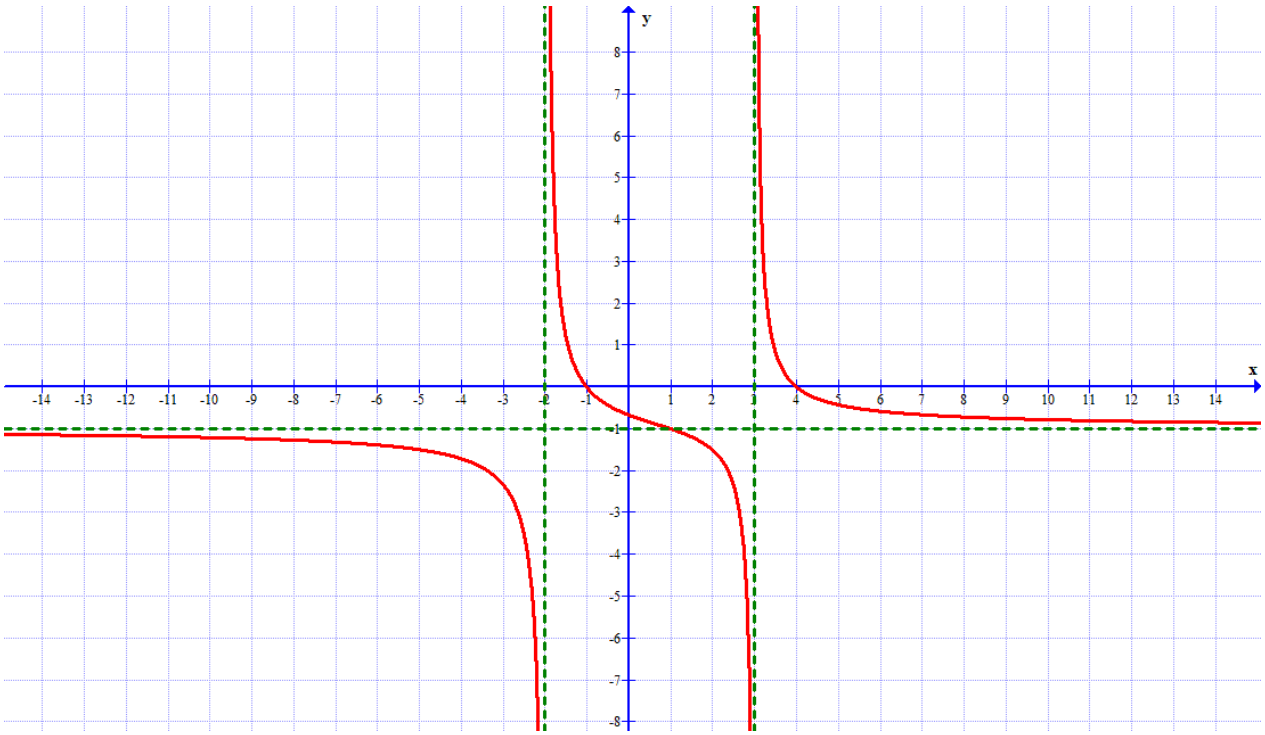
c) $N: x_1=0,\ x_2=2;\ P: x_1=-2,\ x_2=3;\ Ak: y=-1;\ P_{Ak}: x=6$



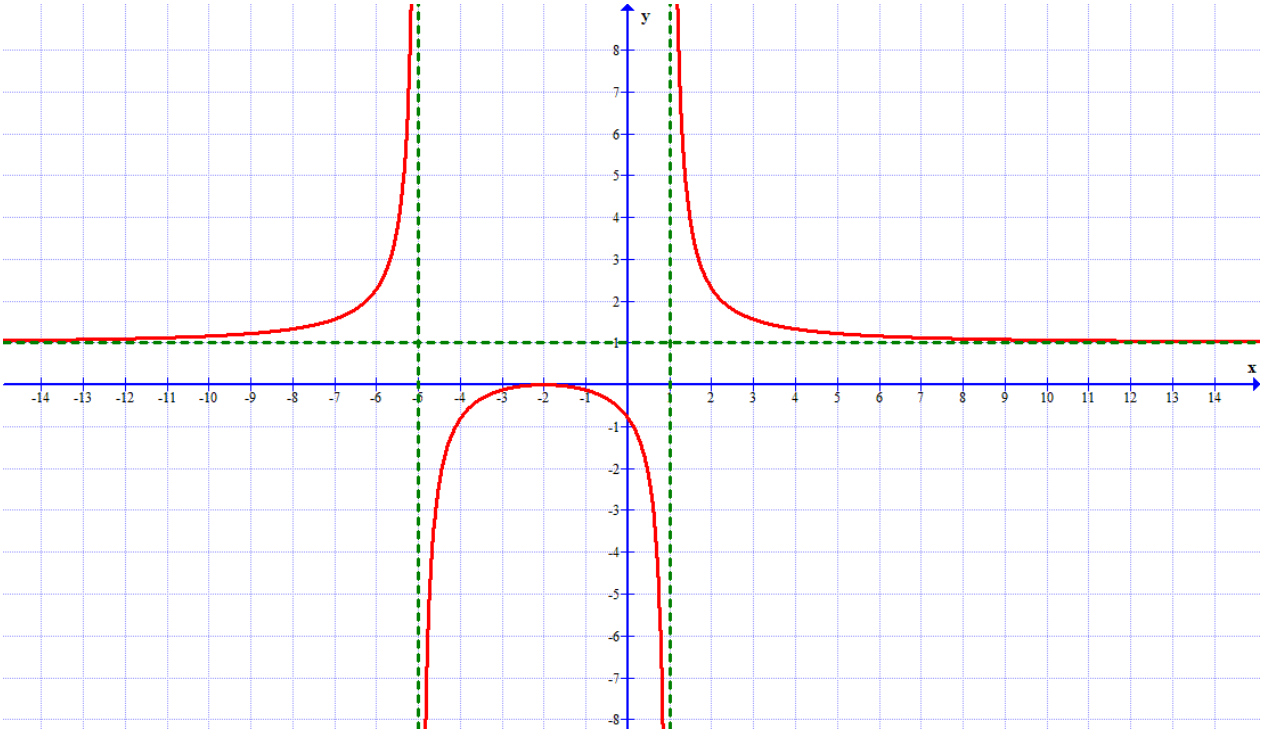
d) $N: x_1 = -1,\ x_2 = 5;\ P: x_{1,2} = 1;\ Ak: y = 1;\ P_{Ak}: x = -3$



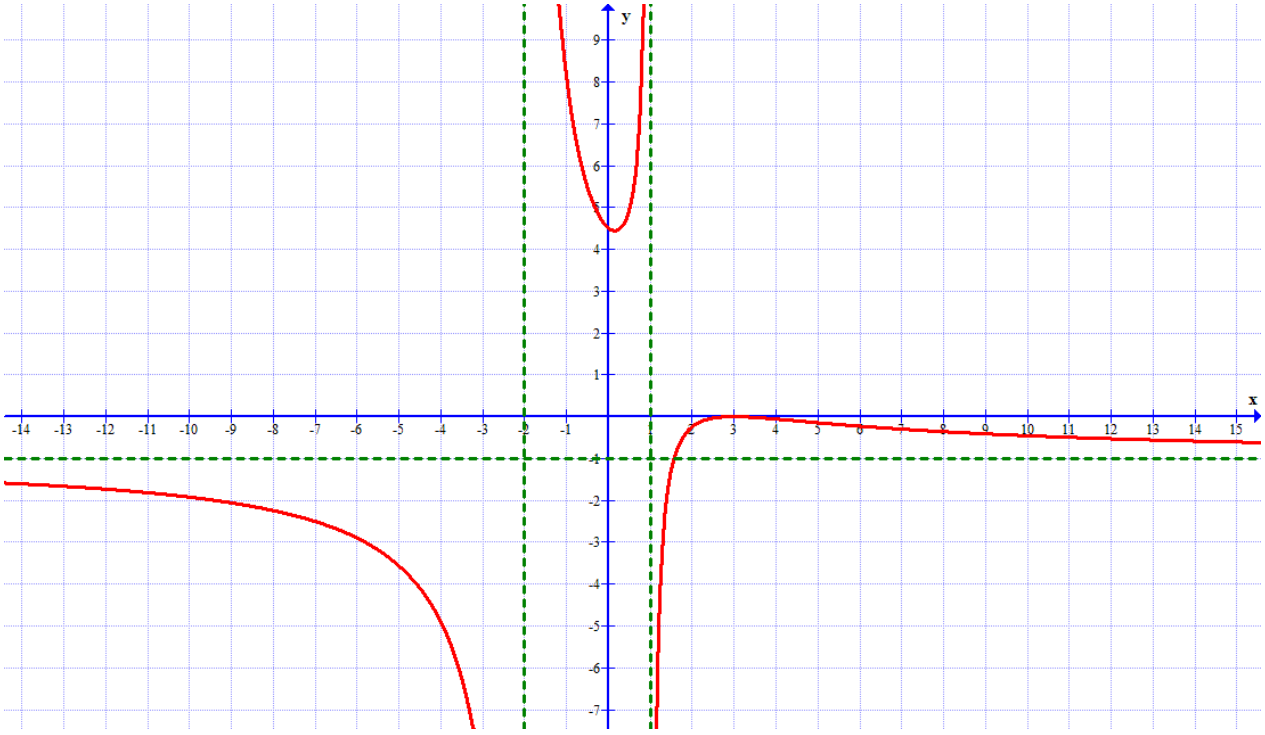
9) a) $N: x_1 = -1,\ x_2 = 4;\ P: x_1 = -2,\ x_2 = 3;\ Ak: y = -1;\ P_{Ak}: x = 1$



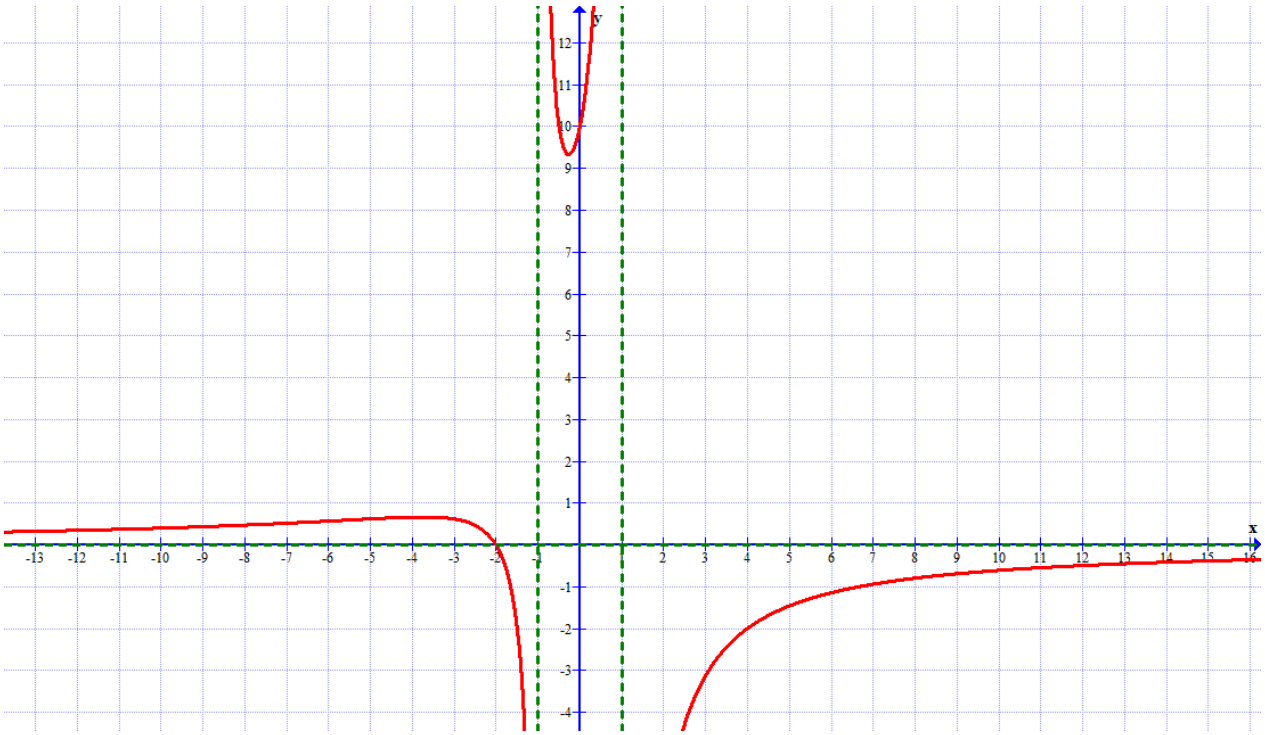
b) $N: x_{1,2} = -2;\ P: x_1 = -5,\ x_2 = 1;\ Ak: y = 1;\ P_{Ak}: \varnothing$



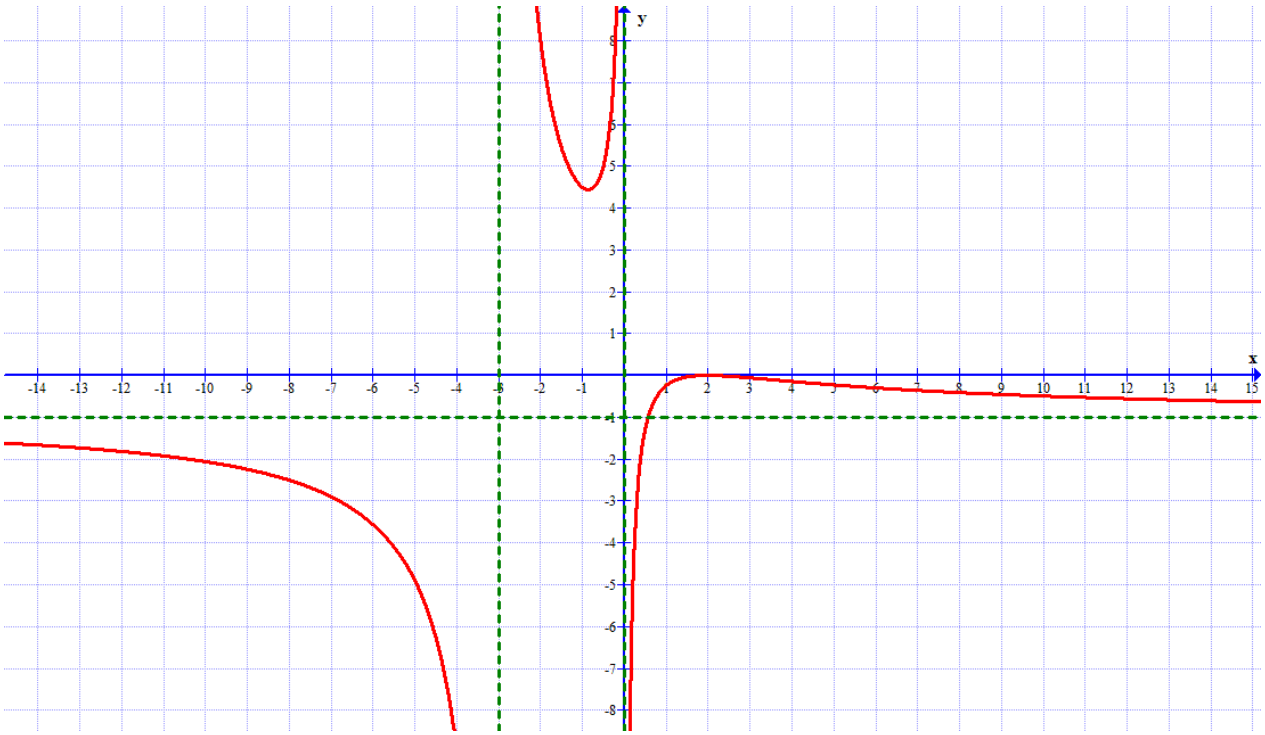
c) $N: x_{1,2} = 3;\ P: x_1 = -2,\ x_2 = 1;\ Ak: y = -1;\ P_{Ak}: x = \frac{11}{7}$



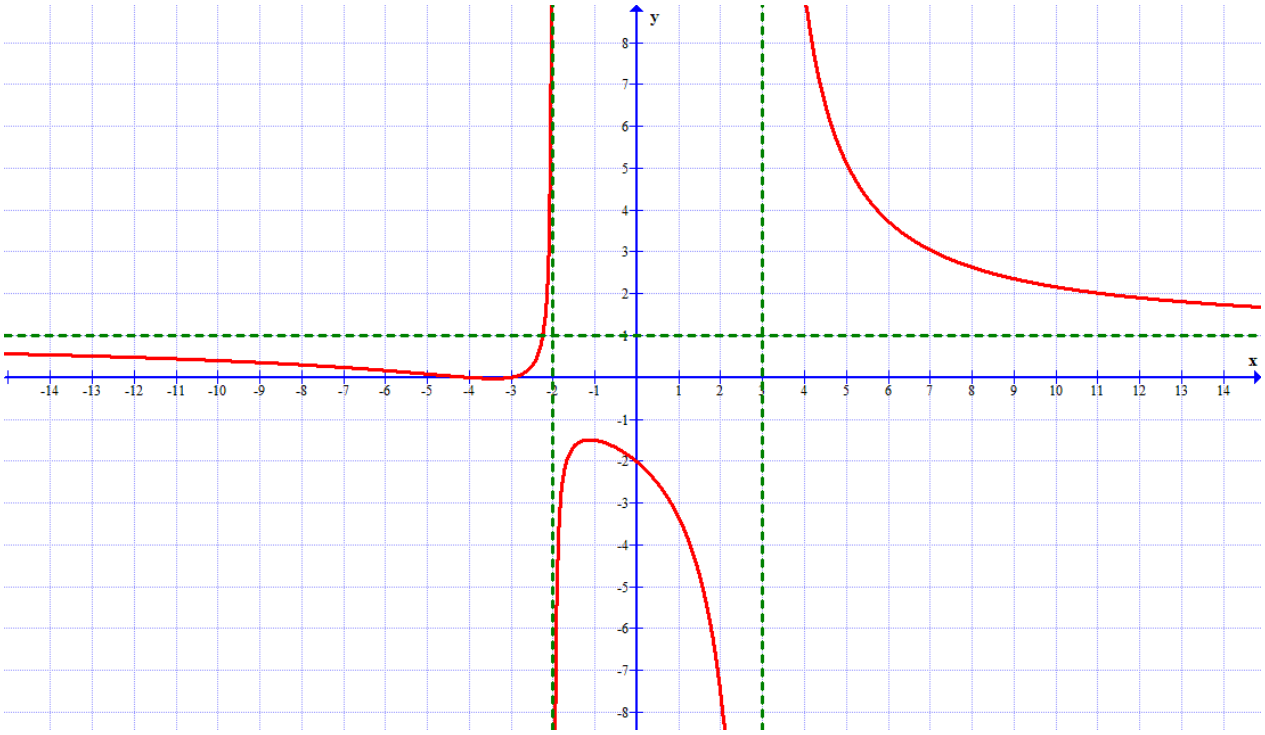
d) $f(x)=\dfrac{5x+10}{-x^2+1}$ $N: x=-2;\ P: x_1=-1,\ x_2=1;\ Ak: y=0;\ P_{Ak}: x=-2$



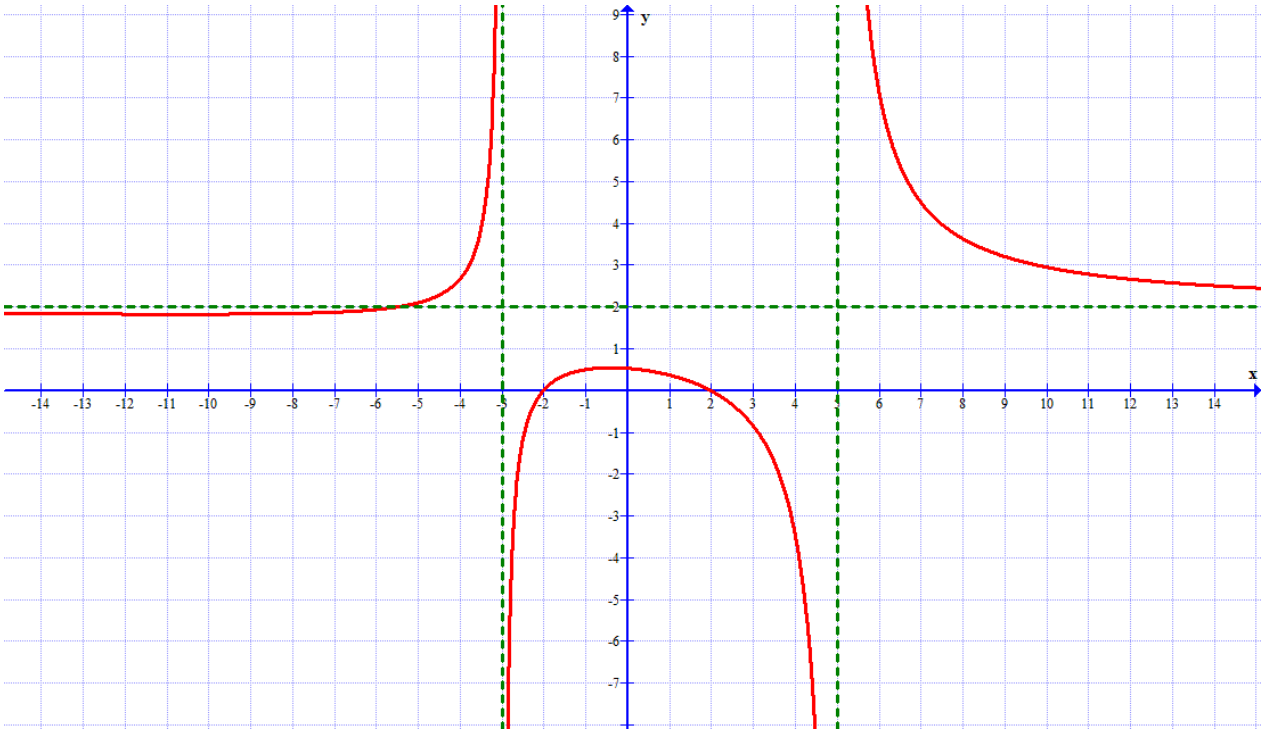
10) a) $N: x_{1,2}=2;\ P: x_1=-3,\ x_2=0;\ Ak: y=-1;\ P_{Ak}: x=\frac{4}{7}$



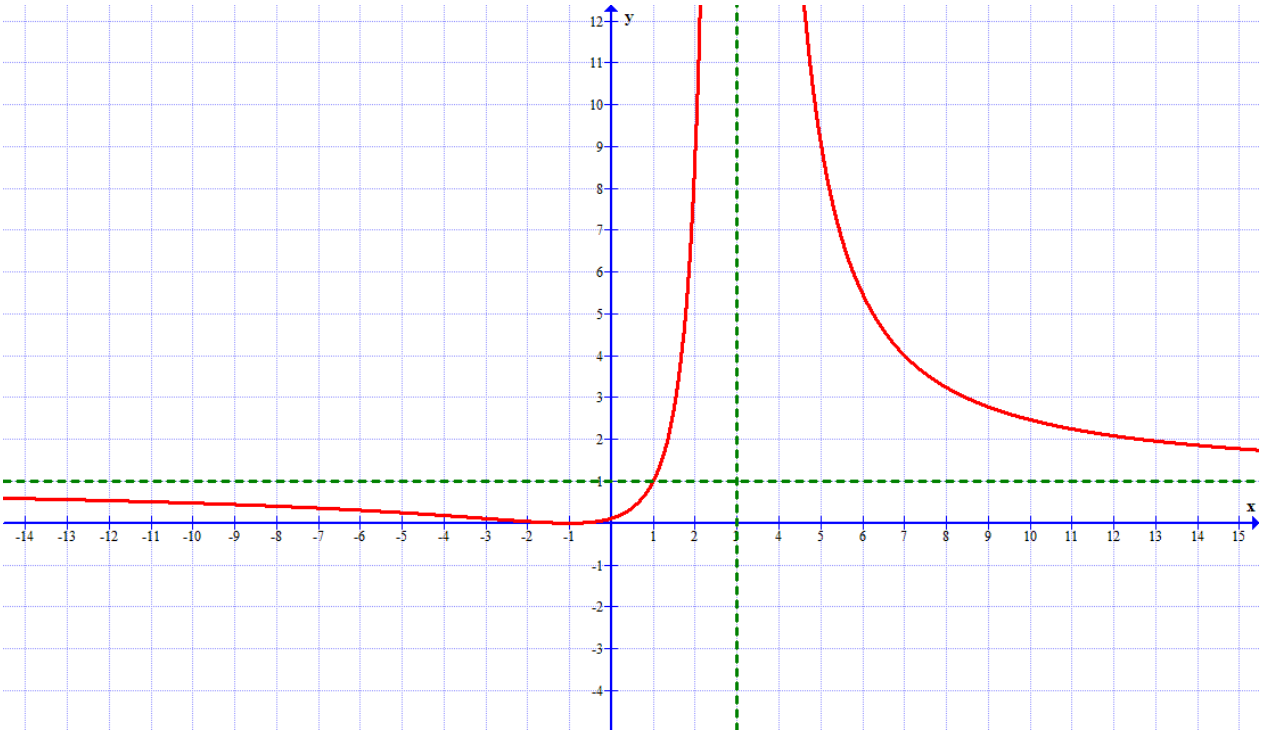
b) $N: x_1 = -4,\ x_2 = -3;\ P: x_1 = -2,\ x_2 = 3;\ Ak: y = 1;\ P_{Ak}: x = -\frac{9}{4}$



c) $N: x_1 = -2,\ x_2 = 2;\ P: x_1 = -3,\ x_2 = 5;\ Ak: y = 2;\ P_{Ak}: x = -\frac{11}{2}$



d) $f(x)=\dfrac{x^2+2x+1}{x^2-6x+9}$ $N: x_{1,2}=-1;\ P: x_{1,2}=3;\ Ak: y=1;\ P_{Ak}: x=1$



11) a) $P_1(-2,0),\ P_2(8,0),\ P_3(0,-4)$

b) $x=-4,\ x=2,\ y=-2$

c) 17