

$$f(x) = \frac{x^3}{x^2-4}$$

$$x^2 - 4 \neq 0$$

$$x^2 = 4$$

$$x \neq 2 \vee x \neq -2$$

$$\begin{array}{r} x \\ \hline x^3 : x^2 - 4 \\ -x^3 + 5x \\ \hline 4x \end{array}$$

$$x \left( \frac{x^2-4}{x^2-4} + \frac{4x}{x^2-4} \right) = x \left( \frac{4x}{x^2-4} \right)$$

a)  $\frac{x}{(x+1)(x+2)(x-3)}$

$$\text{Nur } > 2$$

$$\text{Nur } > 1$$

$$x \neq -1$$

$$x \neq -2$$

$$x \neq 3$$

$$D = \mathbb{R} - \{-2, -1, 3\}$$

$$\frac{x}{(x+1)(x+2)(x-3)}$$

$$\frac{A}{x+1} + \frac{B}{x+2} + \frac{C}{x-3}$$

$$\frac{x}{(x+1)(x+2)(x-3)} = \frac{A(x-3)(x+2) + B(x+1)(x-3) + C(x+1)(x+2)}{(x+1)(x+2)(x-3)}$$

$$x = A(x^2 + 2x - 3x - 6) + B(x^2 - 3x + x - 3) + C(x^2 + 2x + x + 2)$$

$$x = \underline{A} \underline{x^2} - \underline{A} \underline{x} - \underline{A} \underline{6} + \underline{B} \underline{x^2} - \underline{B} \underline{2x} - \underline{B} \underline{3} + \underline{C} \underline{x^2} + \underline{3x} + \underline{C} \underline{2}$$

$$x = x^2(A+B+C) + x(-A-2B+3C) - 6A-3B+2C$$

$$A+B+C=0$$

$$-A-2B+3C=1$$

$$-6A-3B+2C=0$$

$$C = -A-B$$

$$-3A-A-2B-3B=1$$

$$-4A-5B=1$$

$$\left[ \begin{array}{l} (x+1)^2 \quad \frac{A}{x+1} + \frac{B}{(x+1)^2} \\ (x^2 + 1 + 2) \quad \frac{A+B}{x^2 + x + 2} \end{array} \right]$$

b)  $\frac{1}{x^2 - 3x + 2}$

$$\frac{1}{x^2 - 3x + 2} = \frac{A}{(x-1)} + \frac{B}{(x-2)}$$

$$\Delta = 9 - 4 \cdot 2 \cdot 1 = 1$$

$$x_1 = \frac{3-1}{2} = 1$$

$$x_2 = \frac{3+1}{2} = 2$$

$$Ax - 2A + Bx - B$$

$$x(A+B) - 2A - B$$

$$-2A - B = 1$$

$$A + B = 0$$

$$A = -B$$

$$+2B - B = 1$$

$$\underline{\underline{B = 1 \wedge A = -1}}$$

$$[-2(-1) - B]$$

$$-2A - A = 1$$

$$-A = 1$$

$$A = -1$$

$$\frac{1}{x-1} + \frac{-1}{x-2} = \frac{1}{x^2 - 3x + 2}$$

f)  $\frac{x^2+4x+6}{x+4} > 3,$

$$\frac{x^2+4x+6}{x+4}$$

$$\frac{x^2+4x+6-3x-12}{x+4} > 0$$

$$D \in \mathbb{R} - \{-4\}$$

$$\frac{x^2+x-6}{x+4} > 0$$

$$\stackrel{\text{BRUH}}{(x+4)(x^2+x-6)} > 0$$

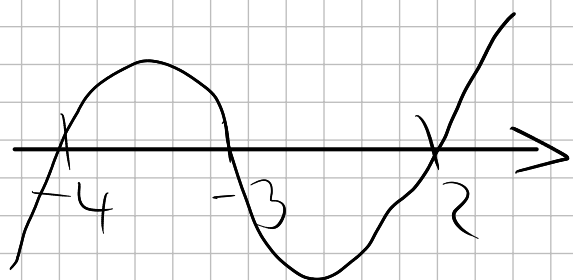
$$x^2+x-6$$

$$\Delta = 1 - 4 \cdot 1 \cdot -6 = 25$$

$$(x+4)(x+3)(x-2) > 0$$

$$\frac{-1+5}{2} = 2$$

$$\frac{-1-5}{2} = -3$$



$$x \in (-4, -3) \cup (2, \infty)$$

c)  $\frac{1}{2-x} + \frac{1}{2+x} < 1,$

$$\frac{2+x+2-x-(2-x)(2+x)}{(2-x)(2+x)} < 0$$

$$\cancel{4} - x^2$$

$$D = \mathbb{R} - \{-2, 2\}$$

$$(2-x)(2+x) - x^2 < 0$$

$$4 - x^2 - x^2 < 0$$

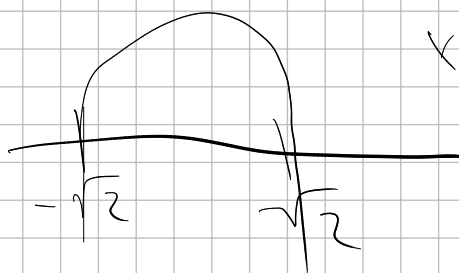
$$4 - 2x^2 < 0 \quad 2 - x^2 < 0$$

$$(\sqrt{2}-x)(\sqrt{2}+x)$$

$$x = \sqrt{2} \quad x = -\sqrt{2}$$

$$x^2 > 2$$

$$x > \sqrt{2} \vee x < -\sqrt{2}$$



$$x \in (-\infty, -\sqrt{2}) \cup (\sqrt{2}, \infty)$$

a)  $\frac{x^5 - x^3 + 1}{x(x+1)^3(x^2-1)^2}$

$$\frac{x(x+1)^3(x-1)(x-1)(x+1)(x+1)}{x(x+1)^5(x-1)^2}$$

$$\frac{A}{x} + \frac{B}{x+1} + \frac{C}{(x+1)^2} + \frac{D}{(x+1)^3} + \frac{E}{(x+1)^4} + \frac{F}{(x+1)^5} + \frac{G}{(x-1)} + \frac{H}{(x-1)^2}$$

ZADANIE 16. Dana jest funkcja określona wzorem  $f(x) = \frac{1}{x}$ . Rozwiązać nierówność:

$$f(x) - f\left(\frac{1}{x}\right) < f(x^3) - f\left(\frac{1}{x^3}\right)$$

czw 16:30

$$\frac{1}{x} - x < \frac{1}{x^3} - x^3$$

$$\frac{1}{x} - x <$$