(1) Det

$$\begin{vmatrix} 1 & 0 & 3 & -2 \\ 2 & -2 & 1 & 1 \\ 1 & 1 & 4 & 0 \\ 0 & -1 & 2 & 7 \end{vmatrix} = (-1)^{1+1} \cdot 1 \cdot \begin{vmatrix} -2 & 1 & 1 \\ 1 & 4 & 0 \\ -1 & 2 & 7 \end{vmatrix} + (-1)^{1+2} \cdot 0 \begin{vmatrix} & & \\ & & \\ & & \end{vmatrix}$$

$$+ (-1)^{1+3} \cdot 3 \cdot \begin{vmatrix} 2 & -2 & 1 \\ 1 & 1 & 0 \\ 0 & -1 & 7 \end{vmatrix} + (-1)^{1+4} \cdot (-2) \begin{vmatrix} 2 & -2 & 1 \\ 1 & 1 & 4 \\ 0 & -1 & 2 \end{vmatrix}$$

$$= \left(-56 + 2 - (-4 + 7)\right) + 3\left(14 - 1 - (-14)\right) + 2\left(4 - 1 - (-8 - 4)\right)$$

$$= -54 - 3 + 3(13 + 14) + 2(3 + 12) = 54$$

(2) $\sum_{n=1}^{\infty} \underbrace{\frac{n+2}{n^3+4}}_{a_n}$ srovnáme s $b_n = \frac{4}{n^3} = \frac{1}{n^2}$ $\quad a_n \geq 0 \quad b_n > 0$

$$\lim_{n\to\infty} \frac{a_n}{b_n} = \lim_{n\to\infty} \frac{n+2}{n^3+4} \cdot \frac{n^3}{n} = \lim_{n\to\infty} \frac{1+\frac{2}{n}}{1+\frac{4}{n^3}} = 1 \in (0, \infty)$$

z LSZ plyne, že $\sum a_n$ k $\Leftrightarrow$ $\sum b_n$ k. Ale $\sum b_n$ k (známe).

Tedy $\sum a_n$ k.

(3) $\int \sin x + x + \frac{1}{x}\, dx = \int \sin x\, dx + \int x\, dx + \int \frac{1}{x} dx$

$= -\cos x + \frac{1}{2}x^2 + \ln|x|.$ $\quad x \in (-\infty, 0)$ $\quad x \in (0, \infty)$.

↳ viz už je v tabulce