A. Najdete a tak, aby $f(x) \sim x^a$ pro

1. $f(x) = \operatorname{tg}^3 x, \qquad x \to 0$
2. $f(x) = x \ln x, \qquad x \to +\infty$
3. $f(x) = \ln(1 + \exp(3x)), \qquad x \to +\infty$
4. $f(x) = \frac{x \sin x^2}{(\exp(x^3)-1)\operatorname{arctg}\sqrt{x}}, \qquad x \to 0+$

B. Rozhodnete o konvergenci Newtonovych integralu:

1.
$$\int_0^\infty \frac{dx}{\sqrt[3]{x} + x^3}$$

2.
$$\int_{-\infty}^\infty \frac{\sin x}{1+x^2} dx$$

3.
$$\int_0^\pi \frac{dx}{\sqrt{\sin x}}$$

4.
$$\int_0^{\pi/2} \frac{dx}{1 - \cos x}$$

5.
$$\int_0^\infty \frac{\ln(1+x)}{x^{3/2}}\, dx$$

6.
$$\int_0^\infty \frac{x}{\exp x - 1}\, dx$$

7.
$$\int_0^{\pi/2} \ln(\sin x)\, dx$$

8.
$$\int_1^\infty \arcsin\left(\frac{1}{x}\right)\, dx$$