

## 7. cvičení

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### Teorie

**Věta 1.** Necht'  $\{a_n\}$  je posloupnost reálných čísel,  $A \in \mathbb{R}$  a  $\lim_{n \rightarrow \infty} a_n = A$ . Pak  $\lim_{n \rightarrow \infty} |a_n| = |A|$ .

### Příklady

Vyšetřete **absolutní** konvergenci řad.

1.

$$\sum_{n=1}^{\infty} \sin \frac{1}{n} - \arcsin \frac{1}{n}$$

2.

$$\sum_{n=1}^{\infty} 2 \left[ \operatorname{tg} \left( \frac{1}{n^{1/5}} \right) - \sin \left( \frac{1}{n^{1/5}} \right) \right] - \frac{1}{n^{3/5}}$$

3.

$$\sum_{n=1}^{\infty} \sin \left( \frac{1}{n} - \arcsin \frac{1}{n} \right)$$

4.

$$\sum_{n=1}^{\infty} \ln \frac{1}{n^\beta} - \ln \left( \sin \frac{1}{n^\beta} \right),$$

$\beta > 0$

5.

$$\sum_{n=1}^{\infty} \left( \sin \frac{1}{n} - \frac{1}{n} \right) \frac{1}{n^\alpha},$$

$\alpha \in \mathbb{R}$

6.

$$\sum_{n=1}^{\infty} \sqrt{n+2} - 2\sqrt{n+1} + \sqrt{n}$$

7.

$$\sum_{n=1}^{\infty} \left( e - \left( 1 + \frac{1}{n} \right)^n \right)^p,$$

$p \in \mathbb{R}$

8.

$$\sum_{n=1}^{\infty} \left( e^{\frac{1}{n}} - 1 - \frac{1}{n} \right) \left( \arcsin \frac{1}{n} - \frac{1}{\sqrt{n}} \right)$$

9.

$$\sum_{n=1}^{\infty} \sin \left( \frac{1}{\sqrt{n}} \right) - \ln \left( 1 + \frac{1}{\sqrt[3]{n}} \right)$$

10.

$$\sum_{n=1}^{\infty} \frac{1}{\sqrt{n}} + \ln \left( \sqrt{1 + \frac{1}{n}} - \frac{1}{\sqrt{n}} \right)$$

$$\left( 1 - \left( \frac{u}{1+1} \right)^u u^{\varrho} - 1 \right)^{\varrho} = u \left( \frac{u}{1+1} + 1 \right) - \varrho \quad (2) \bullet$$

$$\frac{u}{z} + 1 \wedge u^{\wedge} = z + u^{\wedge} \quad (9) \bullet$$

$$q/v \text{ u} \text{ l} = q \text{ u} \text{ l} - v \text{ u} \text{ l} \quad (7) \bullet$$