

### 3. cvičení

S využitím srovnávacího kritéria rozhodněte o konvergenci řady:

$$\boxed{1} \quad \sum_{n=1}^{\infty} \frac{\sin^3 n}{2^n}$$

$$\boxed{2} \quad \sum_{n=1}^{\infty} \frac{\operatorname{arccotg} n}{3^n}$$

$$\boxed{3} \quad \sum_{n=1}^{\infty} \sin \frac{1}{n!}$$

$$\boxed{4} \quad \sum_{n=1}^{\infty} \sin(n!)$$

$$\boxed{5} \quad \sum_{n=1}^{\infty} \frac{1}{3^n + 4^n}$$

$$\boxed{6} \quad \sum_{n=1}^{\infty} \frac{4^n}{3^n + 5^n}$$

$$\boxed{7} \quad \sum_{n=1}^{\infty} \frac{4^n}{2^n + 3^n}$$

$$\boxed{8} \quad \sum_{n=1}^{\infty} \frac{4^n}{3^n + 4^n}$$

$$\boxed{9} \quad \sum_{n=1}^{\infty} \frac{1}{\sqrt[3]{n} \cdot 2^n + \sqrt{n}}$$

$$\boxed{10} \quad \sum_{n=1}^{\infty} \frac{3^n}{2^n - \sqrt{n}}$$

$$\boxed{11} \quad \sum_{n=1}^{\infty} \frac{1}{\sqrt{n} + n!}$$

$$\boxed{12} \quad \sum_{n=1}^{\infty} \frac{\ln n}{n!}$$

Výsledky: (K = konverguje, D = diverguje)  $\boxed{1}$  K;  $\boxed{2}$  K;  $\boxed{3}$  K;  $\boxed{4}$  D;  $\boxed{5}$  K;  $\boxed{6}$  K;  $\boxed{7}$  D;  $\boxed{8}$  D;  $\boxed{9}$  K;  $\boxed{10}$  D;  $\boxed{11}$  K;  $\boxed{12}$  K.

S využitím integrálního kritéria rozhodněte o konvergenci řady:

$$\boxed{1} \quad \sum_{n=1}^{\infty} \frac{1}{n \sqrt[3]{n}}$$

$$\boxed{2} \quad \sum_{n=1}^{\infty} \frac{1}{\sqrt[3]{n}}$$

$$\boxed{3} \quad \sum_{n=1}^{\infty} \frac{1}{n^3}$$

$$\boxed{4} \quad \sum_{n=1}^{\infty} \frac{1}{\sqrt[4]{n^5}}$$

$$\boxed{5} \quad \sum_{n=1}^{\infty} \frac{1}{\sqrt[5]{n^4}}$$

$$\boxed{6} \quad \sum_{n=1}^{\infty} n \cdot e^{-n^2}$$

$$\boxed{7} \quad \sum_{n=1}^{\infty} \frac{1}{1 + n^2}$$

$$\boxed{8} \quad \sum_{n=1}^{\infty} \frac{\ln n}{n}$$

$$\boxed{9} \quad \sum_{n=1}^{\infty} \frac{\ln n}{n^3}$$

Výsledky: (K = konverguje, D = diverguje)  $\boxed{1}$  K;  $\boxed{2}$  D;  $\boxed{3}$  K;  $\boxed{4}$  K;  $\boxed{5}$  D;  $\boxed{6}$  K;  $\boxed{7}$  K;  $\boxed{8}$  D;  $\boxed{9}$  K.

Kombinací srovnávacího a integrálního kritéria rozhodněte o konvergenci řady:

$$\boxed{1} \quad \sum_{n=1}^{\infty} \sin \frac{\pi}{n^2}$$

$$\boxed{2} \quad \sum_{n=1}^{\infty} \sin \frac{\pi}{\sqrt{n}}$$

$$\boxed{3} \quad \sum_{n=1}^{\infty} \frac{1}{\ln(n+5)}$$

$$\boxed{4} \quad \sum_{n=1}^{\infty} \frac{\ln(n^2)}{n^4}$$

<b>5</b>	$\sum_{n=1}^{\infty} \frac{\ln(n^2)}{n^3}$	<b>6</b>	$\sum_{n=1}^{\infty} \frac{n^2 - 5}{n^5 + 3n^4 + 12}$
<b>7</b>	$\sum_{n=1}^{\infty} \frac{1}{\sqrt[3]{n} - \sqrt[4]{n} + 2}$	<b>8</b>	$\sum_{n=1}^{\infty} \frac{1}{\sqrt[3]{n} - n^2 - 2}$
<b>9</b>	$\sum_{n=1}^{\infty} \frac{\cos(n) \cdot \cos(n^3)}{n^3}$	<b>10</b>	$\sum_{n=1}^{\infty} n^2 \cdot \sin\left(\frac{\pi}{n^3}\right) \cdot \sin\left(\frac{\pi}{n^2}\right)$
<b>11</b>	$\sum_{n=1}^{\infty} n^4 \cdot \sin\left(\frac{\pi}{n^3}\right) \cdot \sin\left(\frac{\pi}{n^2}\right)$	<b>12</b>	$\sum_{n=1}^{\infty} \frac{1}{\sqrt{n(n+4)}}$
<b>13</b>	$\sum_{n=1}^{\infty} \frac{1}{\sqrt{n^2(n+4)}}$	<b>14</b>	$\sum_{n=1}^{\infty} \frac{\sqrt{n+2} - \sqrt{n+1}}{\sqrt[3]{n^2}}$
<b>15</b>	$\sum_{n=1}^{\infty} \frac{\sqrt{n^2+1} - \sqrt{n^2-1}}{\sqrt{n}}$	<b>16</b>	$\sum_{n=1}^{\infty} \frac{\sqrt{n+3} - \sqrt{n+2}}{\sqrt{n}}$
<b>17</b>	$\sum_{n=1}^{\infty} \frac{1 + \sqrt[4]{n}}{1 + \sqrt[3]{n^4}}$	<b>18</b>	$\sum_{n=1}^{\infty} \frac{1 + \sqrt[3]{n}}{1 + \sqrt[4]{n^3}}$

Výsledky: (K = konverguje, D = diverguje) **1** K; **2** D; **3** D; **4** K; **5** K; **6** K;  
**7** D; **8** K; **9** K; **10** K; **11** D; **12** D; **13** K; **14** K; **15** K; **16** D; **17** K;  
**18** D.