Příklad 1 : Spočtěte limitu posloupnosti:

$$\lim_{n\to\infty} \left((n^7+3)^8 - (n^8+2)^7 - 24(n^7+1)^7\right) \cdot \left(\left(1+\frac{1}{16n^6}\right)^8 - \left(1+\frac{1}{18n^8}\right)^6\right)^8 \quad \text{(15 bodů)}$$

$$-\frac{7}{128}$$

$$\lim_{n\to\infty} \frac{\left(n+\frac{2}{n}\right)^{30} - \left(n+\frac{1}{n}\right)^{30}}{\sqrt{(2+n^7)^8 - 2^8}}$$

$$30$$

$$\lim_{n\to\infty} \left((n^{10}+n^3)^7 - (n^7+1)^{10}\right) \cdot \left(\sqrt[3]{\left(1+\frac{1}{n^9}\right)^7} - 1\right)^7$$

$$-\frac{7^7}{3^6}$$

$$\lim_{n\to\infty} \left(\left(25+\frac{1}{n}\right)^6 - \left(5+\frac{1}{n}\right)^{12}\right) \cdot \sqrt[6]{(n+2)^7 - (n-1)^7}$$

$$-54 \cdot 5^{10} \cdot \sqrt[6]{21}$$

$$\lim_{n\to\infty} \frac{(n+7)^{50} - (n^2+1)^{25}}{\sqrt{n^{100}+n^{99}-1} - \sqrt{n^{100}+2n^{99}+1}}$$

$$-700$$

$$\lim_{n\to\infty} \frac{\sqrt{n^5+17\sqrt[6]{n}} - \sqrt{n^5-5\sqrt[6]{n}+1}}{\sqrt[3]{n^5+18n-16} - \sqrt[3]{n^5-9n}}$$

$$\frac{11}{9}$$

$$\lim_{n\to\infty} \left((n^5+2)^{25} - (n+5)^{125}\right) \cdot \left(\left(1+\frac{1}{25n^4}\right)^{125} - 1\right)^{31}$$

$$-5^{35}$$

$$\lim_{n\to\infty} \frac{(n^2+3)^{50} - (n+\frac{1}{n})^{100}}{(n+2)^{99} - (n+3)^{99}}$$

$$-\frac{50}{99}$$

$$\lim_{n\to\infty} \frac{\left(2+\frac{1}{n}\right)^{100} - \left(4-\frac{3}{n}\right)^{50}}{\left(8-\frac{1}{n}\right)^{34} - \left(4+\frac{1}{n}\right)^{51}} \quad -175/136$$