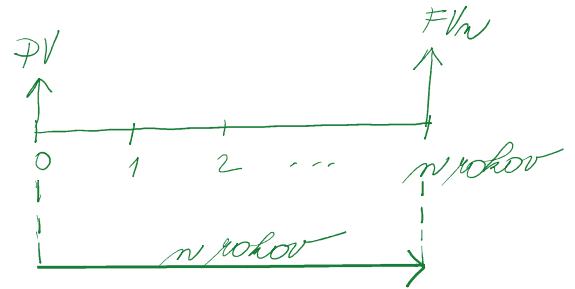


# ZLOŽENÉ ÚROKOVANIE

## POČET KONVERZIÍ $m=1$

$$FV_n = PV (1+i)^n$$



ÚROČENIE

PR 1

$$PV = 500$$

$$i = 0,036$$

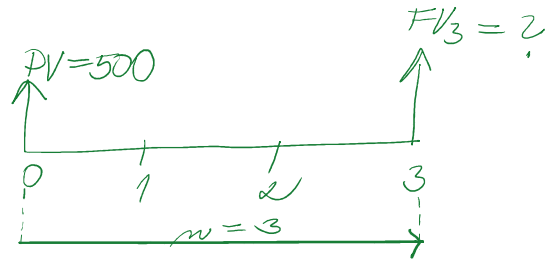
$$n = 3$$

$$m = 1$$

$$FV_3 = ?$$

$$FV_n = PV(1+i)^n$$

$$FV_3 = 500(1+0,036)^3 = \underline{555,967}$$



PR 2

$$PV = 50\,000$$

$$FV = 65\,000$$

$$i = 0,08$$

$$n = 2$$

$$m = 1$$

$$FV_2 = ?$$

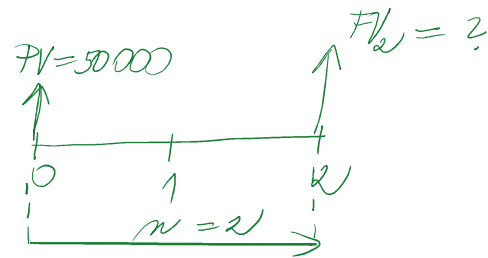
$$FV_n = PV(1+i)^n$$

$$FV_2 = 50\,000(1+0,08)^2 = 58\,320$$

$$FV_2 < FV$$

$$58\,320 < 65\,000$$

JE VÝHODNEJŠIE KÚPIŤ NEHNUTEĽNOSŤ



PR 3

$$FV_{15} = 3PV$$

$$n = 15$$

$$i = 2$$

$$FV_n = PV(1+i)^n$$

$$3PV = PV(1+i)^{15}$$

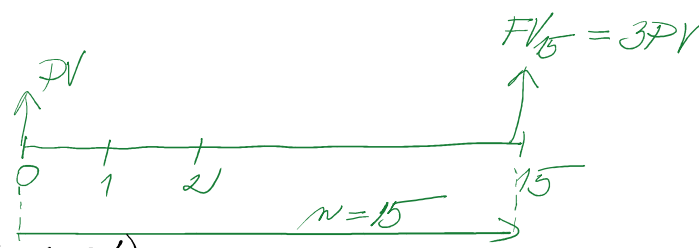
$$3 = (1+i)^{15}$$

$$1+i = \sqrt[15]{3}$$

$$\begin{array}{l} \cdot \frac{1}{PV} \quad (:PV) \\ \hline \phantom{3} = (1+i)^{15} \\ \phantom{3} = \sqrt[15]{3} \\ \phantom{3} - 1 \end{array}$$

$$i = \sqrt[15]{3} - 1$$

$$i = \underline{0,076}$$



$$FV_n = 2PV$$

PR4

$$FV_n = 2PV$$

$$i = 0,05$$

$$n = ?$$

$$m = 1$$

$$FV_n = PV(1+i)^n$$

$$2PV = PV(1+0,05)^n \quad | :PV$$

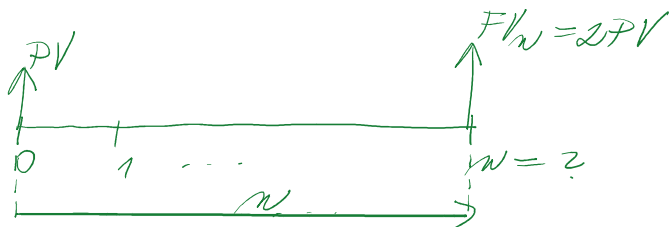
$$2 = 1,05^n \quad | \ln(\ )$$

$$\ln 2 = \ln 1,05^n$$

$$b = \ln 2 = n \ln 1,05 = a \quad | \frac{1}{\ln 1,05}$$

$$n = \frac{\ln 2}{\ln 1,05}$$

$$n = 14,2$$



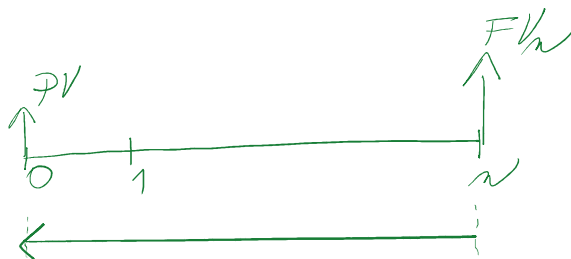
$$b = a \cdot x \quad | :a$$

$$x = \frac{b}{a}$$

$$\log_a x^y = y \log_a x$$

$$\ln x^y = y \ln x$$

$$PV = \frac{FV_n}{(1+i)^n}$$



ODÚROČENIE

PR5

$$FV_6 = 80\,000$$

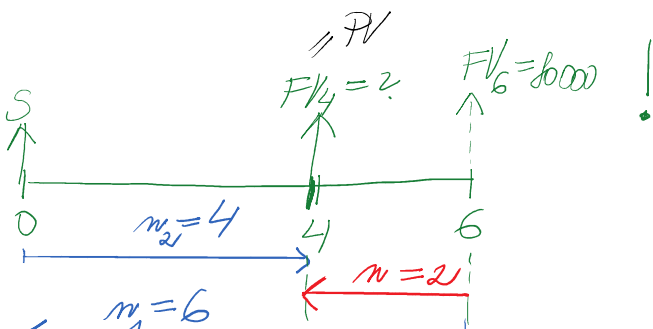
$$i = 0,08$$

$$n = 2 \quad m = 1$$

$$FV_4 = ?$$

$$PV = \frac{FV_n}{(1+i)^n}$$

$$FV_4 = \frac{FV_6}{(1+i)^2} = \frac{80\,000}{(1+0,08)^2} = 68\,587,106$$



$$PV = \frac{FV_6}{(1+i)^6}$$

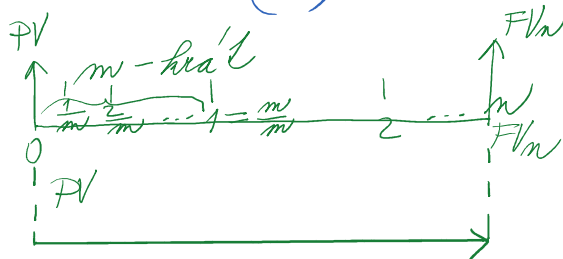
$$FV_4 = PV \cdot (1+i)^4$$

$$FV_4 = \frac{FV_6}{(1+i)^6} \cdot (1+i)^4$$

$$FV_4 = \frac{FV_6}{(1+i)^2}$$

POČET KONVERZII  $m > 1$

$$FV_n = PV \left(1 + \frac{i}{m}\right)^{m \cdot n}$$

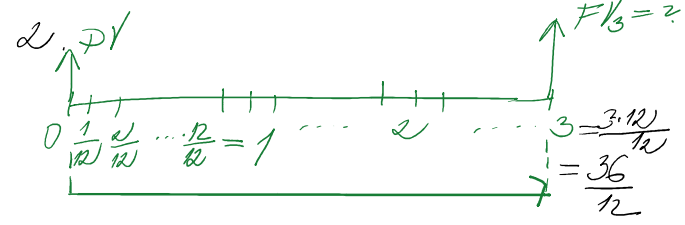
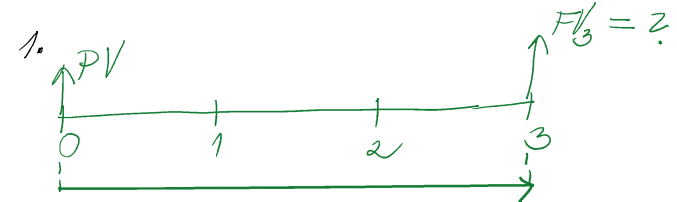


ÚROČENIE

PR 6

$$\begin{aligned}
 1. \quad & PV = 1000 \\
 & i = 0,05 \\
 & n = 3 \\
 & m = 1 \\
 \hline
 & FV_3 = ?
 \end{aligned}$$

$$\begin{aligned}
 2. \quad & PV = 1000 \\
 & j = 0,05 \\
 & n = 3 \\
 & m = 12 \\
 \hline
 & FV_3 = ?
 \end{aligned}$$



$$\begin{aligned}
 1. \quad & FV_n = PV(1+i)^n \\
 & FV_3 = 1000(1+0,05)^3 \\
 & \underline{FV_3 = 1157,625}
 \end{aligned}$$

$$\begin{aligned}
 2. \quad & FV_n = PV \left(1 + \frac{j}{m}\right)^{m \cdot n} \\
 & FV_3 = 1000 \left(1 + \frac{0,05}{12}\right)^{12 \cdot 3} \\
 & \underline{FV_3 = 1161,472}
 \end{aligned}$$

$$PV = \frac{FV_n}{\left(1 + \frac{j}{m}\right)^{m \cdot n}}$$



ODÚROČENIE

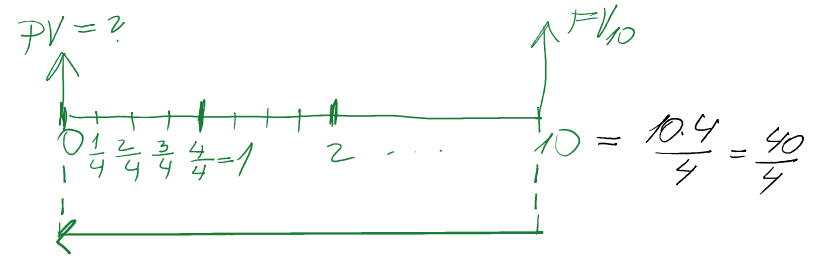
PR 7

$$\begin{aligned}
 FV_{10} &= 50\,000 \\
 j &= 0,05 \\
 n &= 10 \\
 m &= 4 \\
 \hline
 PV &= ?
 \end{aligned}$$

$$PV = \frac{FV_n}{\left(1 + \frac{j}{m}\right)^{m \cdot n}}$$

$$PV = \frac{50\,000}{\left(1 + \frac{0,05}{4}\right)^{4 \cdot 10}}$$

$$\underline{PV = 30\,429,67}$$



PR 8

$$\begin{aligned}
 FV_4 &= 10\,580,1109 \\
 PV &= 8\,000 \\
 n &= 4 \\
 m &= 12 \\
 \hline
 j &= ?
 \end{aligned}$$



$$FV_n = PV \left(1 + \frac{j}{m}\right)^{m \cdot n}$$

$$10580,1109 = 8000 \left(1 + \frac{j}{12}\right)^{12 \cdot 7} \quad | \cdot \frac{1}{8000}$$

$$\frac{10580,1109}{8000} = \left(1 + \frac{j}{12}\right)^{84} \quad | \sqrt[84]{\phantom{x}}$$

$$1 + \frac{j}{12} = \sqrt[84]{\frac{10580,1109}{8000}} \quad | - 1$$

$$\frac{j}{12} = \sqrt[84]{\frac{10580,1109}{8000}} - 1 \quad | \cdot 12$$

$$j = \left(\sqrt[84]{\frac{10580,1109}{8000}} - 1\right) \cdot 12$$

$$j = 0,04$$

$$j \cdot 100\% = 4\%$$

PR 9

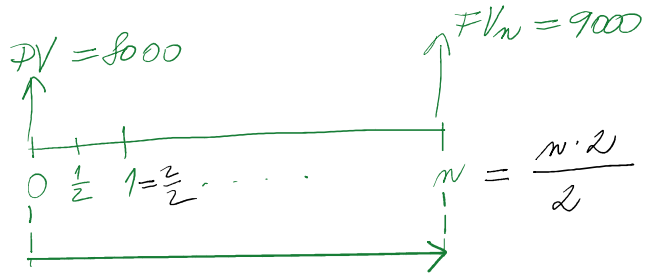
$$PV = 8000$$

$$m = 2$$

$$j = 0,05$$

$$FV_n = 9000$$

~~$$m = \frac{1}{2}$$~~



$$n = ?$$

$$FV_n = PV \left(1 + \frac{j}{m}\right)^{m \cdot n}$$

$$9000 = 8000 \left(1 + \frac{0,05}{2}\right)^{2n} \quad | : 8000$$

$$\frac{9}{8} = \left(1 + \frac{0,05}{2}\right)^{2n} \quad | \ln(\phantom{x})$$

$$\ln \left(1 + \frac{0,05}{2}\right)^{2n} = \ln \frac{9}{8}$$

$$2n \cdot \ln 1,025 = \ln \frac{9}{8} \quad | \cdot \frac{1}{2 \ln 1,025}$$

$$n = \frac{\ln \frac{9}{8}}{2 \ln 1,025}$$

$$n = 2,38 \text{ roka}$$

$$\log_{10} X = \log X$$

$$a = 10$$

$$\log_e X = \ln X$$

$$a = e$$