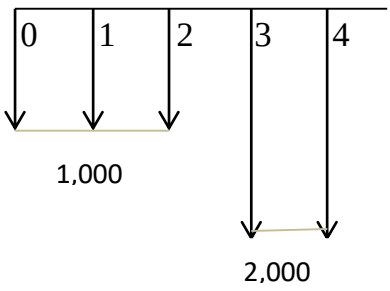
Tutorial 3

1- How many years from now the value of the given cash flow diagram will be equal to $20,000? İnterest rate is 10% per year.



Solution:

P(0) = 1,000 + 1,000 * (P/A,10%,2) + 2,000 * (P/A,10%,2) * (P/F,10%,2) = 5,603.9

F(n) = 20,000

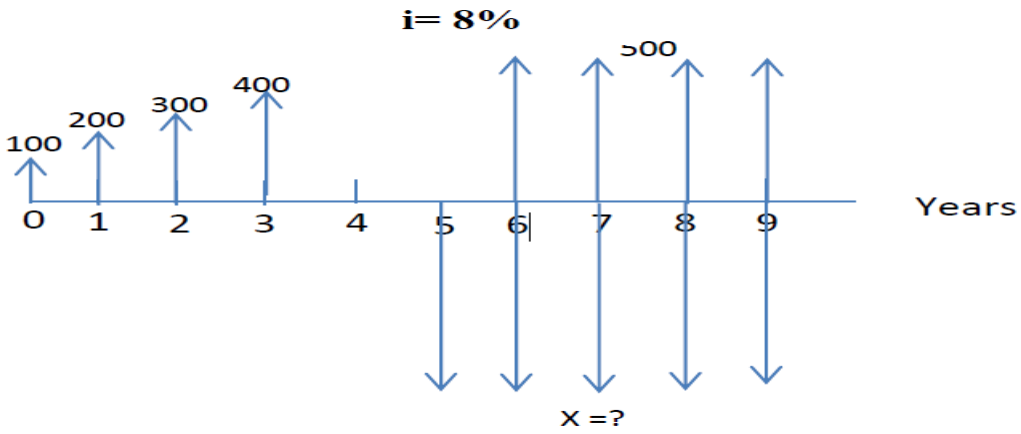
5,603.9 * (F/P,10%,n) = 20,000

5,603.9 * $(1+0.1)^n$ = 20,000

$(1.1)^n$ = 3.5689

n * ln(1.1) = ln (3.5689) >>> n = 13.34

2- Find the value of the unknown quantity in the cash flow diagram shown below, to establish equivalences of cash inflows and outflows (*i*= %8).



Since cash inflows and outflows are equivalent, their values are equal at a given time for example in your -1.

100(P/A, 8%, 4) + 100(P/G, 8%, 4) + 500(P/A, 8%, 4) * (P/F, 8%, 6) = X (P/A, 8*, 5) * (P/F, 8%, 5)
X = 677.17

3- For an interest rate of 8% per year, determine:

a) Effective interest rate per year if interest is compounded daily?

b) Effective interest rate semiannually if interest is compounded daily?

c) Effective interest rate per year if interest is compounded monthly?

d) Effective interest rate semiannually if interest is compounded every six months?

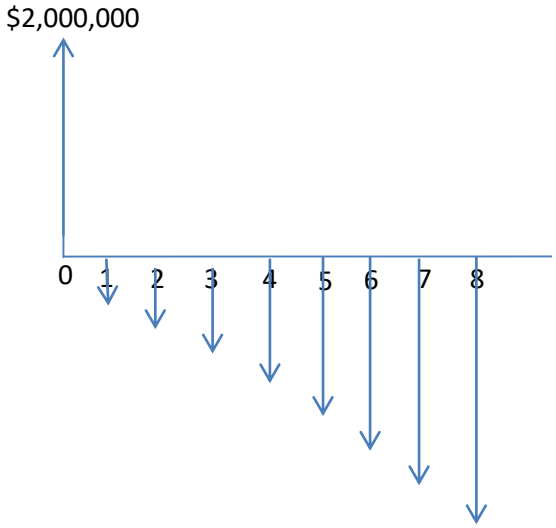
a) Effective i/year = $(1+\frac{r}{m})^m - 1 = (1+\frac{0.08}{365})^{365} - 1 = 8.33\%$

b) Effective i/semi-annually = $(1+\frac{r}{m})^m - 1 = (1+\frac{0.04}{182.5})^{182.5} - 1 = 4.081\%$

c) Effective i/year = $(1+\frac{0.08}{12})^{12} - 1 = 8.29\%$

d) Effective i/ semi-annually = $(1+\frac{0.04}{1})^1 - 1 = 4\%$

4- Fieldsaver technologies, a manufacturer of precision laboratory equipment, borrowed $2 million to renovate one of its testing labs. The loan was repaid in 2 years through quarterly payments that increased by $50,000 each time. At an interest rate of 3% per quarter, what was the size of the first quarterly payment?



Effective i/quarter = $(1+\frac{r}{m})^m - 1 = (1+\frac{0.03}{1})^1 - 1 = 3\%$

2,000,000 = A (P/A, 3%, 8) + 50,000 (P/G, 3%, 8) ⟶ A= $117,665