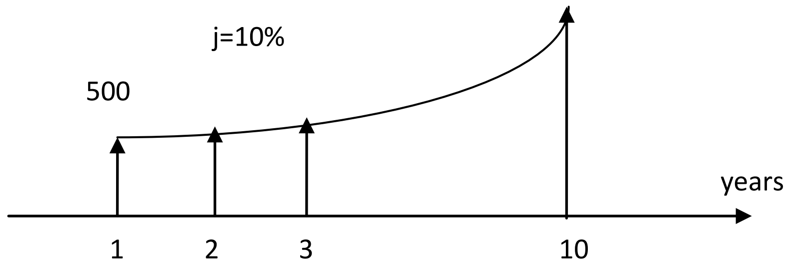
i=√

n=10



A_1=500 A_2=0.1× A_1+ A_1 = 0.1×500 +500= 550 OR A_2=1.1× A_1= 550

A_3=1.1× A_2= 1.1×550=605 A_{10}=1.1× A_9=??????

$A_n=A_t(1\pm j)^{n-t}$ ⟹ $A_{10}= A_1(1+0.1)^{10-1} = 500(1.1)^9= 1179$

OR $A_{10}= A_3(1+0.1)^{10-3} = 605(1.1)^7 = 1179$

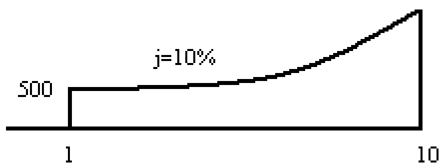
Ex.9(Ex2.31/75)

Ali receives an annual bonus and deposits it in a saving account that pays 8 % compounded annually. The size of bonus increase by 10% Each year, his initial deposit is $ 500. How much will be in the fund ?

a) Immediately after the tenth year b) Immediately before the tenth year

Solution

n=10 years A_1=$500 i=8% j=10%



a) By table

F= A_1(F|A_1 i%,j%,n)=500 (F|A_1 8%,10%,10)= 500 (21.8259) = $ 10912.96

By formula

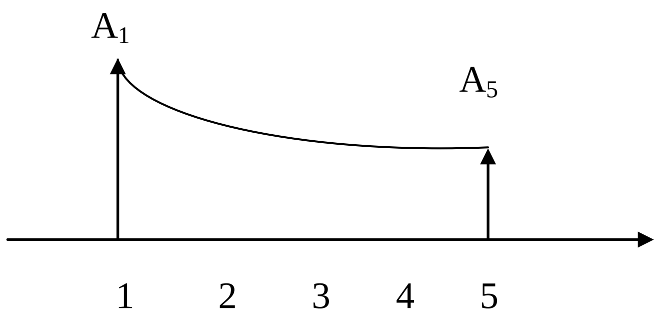
$$F = A_1 \frac{(1+i)^n-(1+j)^n}{i-j} = 500 \frac{(1+0.08)^{10}-(1+0.1)^{10}}{0.08-0.1} = \$\ 10870.44$$

b) F= 10870.44 - A_{10} = 10870.44 - 1179 = $ 9691.44

Ex.

John borrows \$ 15,000 at 18% compounded annually, he pays off the loan over a 5- year period with annual payments. Each successive payment is to be 10% less than the previous payment. How much will be the fifth payment.

Solution



$$P = A_1 \frac{1-(1-j)^n(1+i)^{-n}}{i+j}$$

$$15000 = A_1 \frac{1-(1-0.1)^5(1+0.18)^{-5}}{0.18+0.1} \Longrightarrow A_1 = \$\ 5661.2$$

$$A_5 = A_1(1-j)^{(5-1)} = 5661.2(1-0.1)^4 = \$\ 3714.3$$