Answer on Question #79025 –Math – Financial Math

Question

You have a loan outstanding. It requires making 6 annual payments at the end of the next **66 (In my opinion this is a mistake. The value should be equal to 6)** years of $8,000 each. Your bank has offered to allow you to skip making the next 5th payments in lieu of making one large payment at the end of the loan's term in 6 years. If the interest rate on the loan is 8.16 %, what final payment will the bank require you to make so that it is indifferent between the two forms of payment?

Solution

In order for both forms of payment to be the same the present value of all cash flow for 6 annual payments ($PV_{1\text{-}6}$) should be equal to present value of one large payment (PV).

Let's find present value of all cash flows for 6 annual payments. The calculation is shown in table form.

Year, (t)	Annual Payment CF(t),$	Present Value of annual payment, PV(t),$	Formula for PV in year t (discount rate= r= 8.16%) $PV(t) = \frac{CF(t)}{(1+r)\text{^}t}$
1	8000	7396.449704	PV(1)= $\frac{8000}{(1+0.0816)\text{^}1}$
2	8000	6838.433528	PV(2)= $\frac{8000}{(1+0.0816)\text{^}2}$
3	8000	6322.516206	PV(3)= $\frac{8000}{(1+0.0816)\text{^}3}$
4	8000	5845.52164	PV(4)= $\frac{8000}{(1+0.0816)\text{^}4}$
5	8000	5404.513351	PV(5)= $\frac{8000}{(1+0.0816)\text{^}5}$
6	8000	4996.776397	PV(6)= $\frac{8000}{(1+0.0816)\text{^}6}$
Sum		36804.21083	$PV_{1\text{-}6} = \sum_{t=1}^{6} PV(t)$

Formula for final payment:

$PV = 36804.21083 = \frac{CF6}{(1+0.0816)\text{^}6}$, therefore

CF6= 36804.21083*(1+0.0816)^6= 58924.72731

Answer: 58924. 72731