

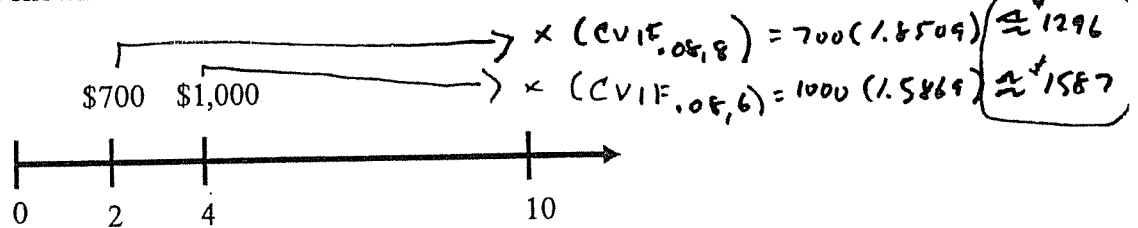
1. Tanker Transport has current annual fuel costs of \$100,000. What is your estimate of the company's fuel costs 8 years from now if fuel costs are expected to increase at an annual rate of 10%?

$$FV = PV (CVIF_{10,8}) = 100,000 (2.1436) = \$214,360$$

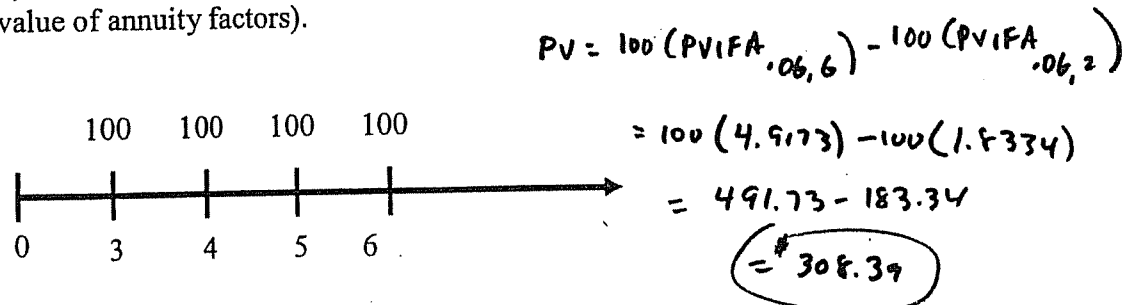
2. If $r = 10\%$, what minimum payment to be received in 5 years would be preferred over \$16,000 to be received in 10 years?

\Rightarrow PV of pymt in 5 yrs $>$ PV of pymt in 10 yrs.
 $\Rightarrow X (PVIF_{10,5}) > 16,000 (PVIF_{10,10}) \Rightarrow X > \frac{16,000 (0.3855)}{0.6209} \approx \9934

3. What is the future value in 10 years from the present (assume $r = 8\%$) of each of the two dollar amounts shown on the time line below?



4. If $r = 6\%$, what is the present value of the income stream shown below (calculate using the present value of annuity factors).



5. If you borrow \$1,000 today at 11%, how many years from now would you have to pay off the loan with a \$1,685 principal and interest payment?

$$PV = FV (PVIF_{r,n}) \Rightarrow 1000 = 1685 (PVIF_{11,n})$$

$$\Rightarrow PVIF_{11,n} = \frac{1000}{1685} = 0.5934 \Rightarrow n \approx 5$$

6. Jane's salary today is \$58,771. Five years ago it was \$40,000. What has been the compound annual rate of her salary increases over this time?

$$FV = PV (CVIF_{r,n}) \Rightarrow 58,771 = 40,000 (CVIF_{r,5})$$

$$\Rightarrow CVIF_{r,5} = \frac{58,771}{40,000} = 1.4693 \Rightarrow r \approx 8\%$$

Thus

7. Cy has decided he/she would like to invest annually into a savings account in order to have \$200,000 additional retirement money in 40 years. Cy is considering two options: A = invest an equal annual amount ($= X_A$) for 40 years starting 1 year from now or B = invest an equal annual amount ($= X_B$) for 25 years starting 15 years from now. What are the values of X_A and X_B if $r = 7\%$?

See attached (below)

8. Assume U.R., a co-op employee, needs a pickup truck over the next 5 years in order to do the job that he has been hired to do by the co-op. Fortunately for U.R., the co-op has agreed to provide him with a truck. The co-op is considering two alternative truck purchase options – buy a new truck or buy a used truck. The co-op manager has developed the (assume after-tax) annual end-of-year figures below for the two options.

Year	Item	New Truck	Used Truck
0	Initial purchase expense	\$30,000	\$20,000
1	Annual expenses	\$1,500	4,000
2	Annual expenses	\$1,500	4,000
3	Annual expenses	\$1,500	4,000
4	Annual expenses	\$1,500	4,000
5	Annual expenses	\$1,500	4,000
5	Salvage value	0	0

Explain, using formulas, if $r = 6\%$, which truck would you recommend that the co-op purchase?

PV of costs:
 New $\Rightarrow 30,000 + 1,500(PVIFA_{0.06,5}) = 30,000 + 1,500(4.2124) = 36,319$ *
 Used $\Rightarrow 20,000 + 4,000(PVIFA_{0.06,5}) = 20,000 + 4,000(4.2124) = 36,856$
 * prefer new

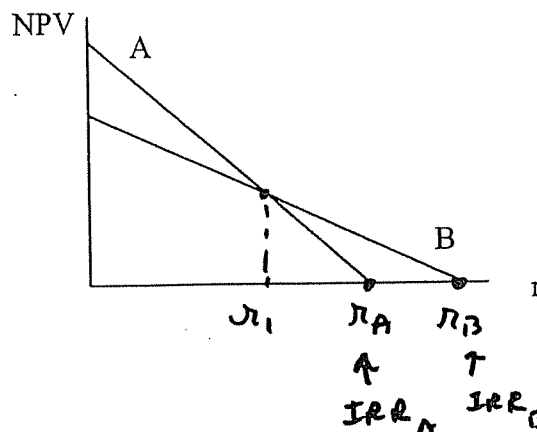
9. Assume Ima Publisher is in charge of pricing 3-year magazine subscriptions for her company. Subscribers are being given two options: 1) one payment to be made now or 2) three equal annual payments of \$40.00 each with the first payment due one year from now. If $r = 8\%$, Ima's company should be equally happy with what single payment now?

\Rightarrow Payment now = PV of annual payments
 $\Rightarrow 40(PVIFA_{0.08,3}) = 40(2.5771) \approx 103.08$

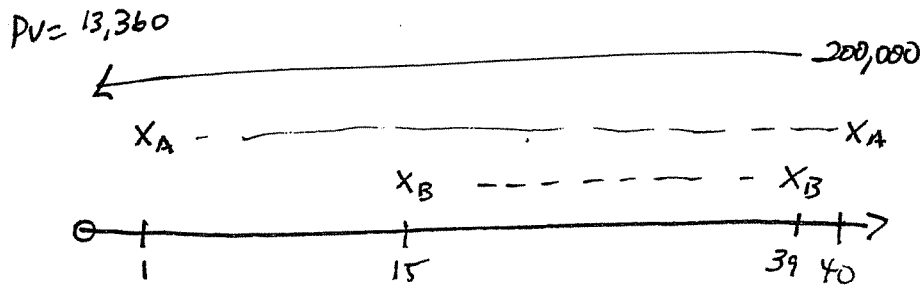
10. Assume a business firm manager can only choose one of the projects below (A or B). Which do you recommend?

If we use NPV method, choose A if $r < r_1$, else choose B.

If we use IRR criterion, choose B.



#7



= a 40-yr annuity (end of yrs 1-40)

$$X_A \Rightarrow 13,360 = X_A (PVIFA_{.07, 40})$$

$$\Rightarrow X_A = \frac{13,360}{13.3317} \approx \$1002$$

= a 25-yr annuity (end of yrs 15-39)

$$X_B \Rightarrow 13,360 = X_B (PVIFA_{.07, 25}) (PVIF_{.07, 14})$$

$$\Rightarrow 13,360 = X_B (11.6536) (.3878)$$

$$\Rightarrow X_B = \frac{13,360}{4.51926} \approx \$2956$$