

IE342 Study Set 1 (2018 Fall)

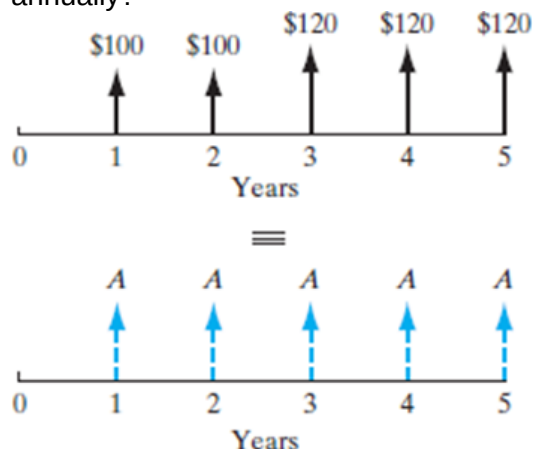
1. Nil, started Bilkent University this year (year 0). 4 years later she wants to buy a prom dress. She starts saving today and at the end of the first year she plans to put \$100 into her bank account. She plans to save more and put \$200 at the end of the 2nd year, \$300 at the end of the 3rd year and \$400 at the end of the 4th year respectively.

a) Draw the cash flow diagram of the savings plan.

b) If she saves the given amounts, how much can the dress cost at the end of the fourth year? ($i=10\%$)

c) What is the present worth of the dress today

2. What value of A makes two annual cash flows equivalent at 12% interest compounded annually?



3. You bought 300 shares SAP stock at \$2,700 on December 31, 2005. Your intention is to keep the stock until it doubles in value. If you expect 10% annual growth for SAP stock, how many years do you anticipate holding onto the stock?

4. A no-load (commission-free) mutual fund has grown at a rate of 8% compounded annually since its beginning. If it is anticipated that it will continue to grow at that rate, how much must be invested every year so that \$15,000 will be accumulated at the end of the fifth year?

5. Five annual deposits in the amounts of \$4,000, \$1,500, \$3,000, \$1,000, and \$1,500 are made into a fund respectively, that pays interest at a rate of 11% compounded annually. Determine the amount in the fund immediately after the fifth deposit.

6. Two close friends Selen and Gül decided to go on a holiday in the spring break which is 6 months later. Selen puts \$300 for the first three months and \$400 for the remaining 3 months. Gül wants help from her brother and she asks him to put the equal amounts of money at the end of each month to her bank account.

2 months later, their friend Fulya want to join them in their vacation and starts to save money. If monthly interest rate is 11%;

a) How much money will Selen have at the end of the sixth month for the vacation?

b) Gül's brother wants to deposit the same amount of money at the end of each month. What should be this amount if Gül want to accumulate the same as Selen at the end of the sixth month?

c) How much money should Fulya put aside at the end of each month in equal amounts to save the same amount of money with her friends in 4 months?

7. Suppose that starting from next year, you are planning to deposit \$2,000 yearly in your saving account for the next 6 years. Starting from the 7th year, you are planning to withdraw \$3,000 yearly for the next 4 years.

a) Draw the cash flow diagram.

b) If interest rate is 11% compounded yearly, what will be the amount of money in your savings account at the end of 10th year?

8. Assume you made an agreement with a bank. In the beginning of first month you borrowed \$7,200 and in the beginning of second month you borrowed \$5,000 at 4% interest rate per monthly and must repay the loan in equal monthly payments in the following four years (48 months). What is the monthly payment amount?

9. A student wants to make annual contributions of \$200 to her savings accounts for 10 years. Calculations shows that she will have X amount of money at the end of 10 years. If the annual interest rate is 4%,

a) How much annual contribution must be made in order to obtain X amount of money if she started saving money 5 years later? (in this case she saves money for 5 years instead of 10 years)

b) How many years would be required to obtain X amount of money by making yearly contributions of \$50?

10. Izgi studies 6-year medicine program at a community college. In the beginning of her first year her tuition fee is \$10,000 and it is expected increase \$1,000 per year over the remaining 5 years. Suppose her family wants to open a savings account that earns 11% annual interest. How much should her family deposit in the beginning of the first year to cover up all tuition fee expenses?

11. A transportation company uses 4 trucks to deliver its orders. A truck runs for 8 hours per day and 60 km in an hour. Fuel costs \$0.80/km. Each truck runs 300 days per year and the interest rate is 18%.

a) First option that Transportation Company can choose is, that they can keep the current trucks but the operating cost will increase by 16% per year for the next years.

b) Second option is that they can buy new trucks for \$448,600 in total and there will be no change in the running time but trucks will use 27% less fuel.

Which option the transportation company choose?

12. A series of equal quarterly payments of \$12,000 for 8 years is equivalent to what present amount at an interest rate of 7% compounded:

(a) Quarterly?

(b) Monthly?

(c) Continuously?

13. What equal series of payments must be paid into a sinking fund to accumulate the following amounts?

a) \$55,000 in 10 years at 7.45% compounded weekly when payments are semiannual.

b) \$35,000 in 15 years at 6.35% compounded monthly when payments are quarterly.

c) \$30,000 in 5 years at 9.25% compounded monthly when payments are monthly.

