

Answer on Question #73171 - Economics / Other

1. Your spendthrift cousins want to buy a fancy watch for \$425. Instead, you suggest that she buy an inexpensive watch for \$25 and save the difference of \$400. Your cousin eventually agrees with your idea and invests \$400 for 40 years in an account earning 9% interest per year. How much will she accumulate in this account after 40 years have passed?

Solution-

Interest Rate (r) = 9%

Principal (P) = \$400

Time (n) = 40 years

Accumulated Amount (A) is given by:

$$A = P \cdot (1 + r)^n$$

$$A = \$400 \cdot (1 + 9\%)^{40}$$

$$\mathbf{A = \$12,563.77}$$

Answer-

She accumulates \$12,563.77 in this account after 40 years have passed.

2. Kris borrows money in her senior year to buy a new car. The car dealership allows her to defer payments for 12 months, and Kris makes 36 end-of-month payments thereafter. If the original note (loan) is for \$24,000 and interest is ½% per month on the unpaid balance, how much will Kris' payments be?

Solution-

$$F_{12} = \$24,000 \cdot (F/P, \frac{1}{2}\%, 12)$$

$$F_{12} = \$24,000 \cdot (1.0617)$$

$$\mathbf{F_{12} = \$25,480.80}$$

$$A = F_{12} * (A/P, \frac{1}{2}\%, 36)$$

$$A = \$25,480.80 * (0.0304)$$

$$\mathbf{A = \$774.62 \text{ per month}}$$

Answer-

The payment of Kris' per month is \$774.62.

3. How much money should be deposited each year for 10 years if you wish to withdraw \$3,000 each year for five years, beginning at the end of 15th year? Let $i=8\%$ per year.

Solution-

$$F_{15} = \$3,000 * (P/A, 8\%, 5)$$

$$F_{15} = \$3,000 * (3.9927)$$

$$\mathbf{F_{15} = \$11,978.10}$$

$$P_0 = F_{15} (P/F, 8\%, 14)$$

$$P_0 = \$11,978.10 * (0.3405)$$

$$\mathbf{P_0 = \$4,078.54}$$

$$A = P_0 (A/P, 8\%, 10)$$

$$A = \$4,078.54 * (0.1490)$$

$$\mathbf{A = \$607.70}$$

Answer-

The money should be deposited \$607.70 each year for 10 years if you wish to withdraw \$3,000 each year for five years.