

Answer on Question #38547 – Economics – Economics of Enterprise

Andrew construction borrows the entire cost of a new dump truck. The loan has an annual interest rate of 12 percent and calls for monthly payments of \$1,000 over a five-year period. What is the cost of the truck?

Solution

The periodic loan payment amount is determined with this formula:

$$R = \frac{Pi}{1-(1+i)^{-n}},$$

where R is the regular payment you will be making, P is amount borrowed, i is the periodic interest rate (the annual rate divided by the number of times each year you are making payments), $i=r/1200$ (if monthly) and n is the number of payments (if monthly, $n=N*12=5*12=60$), r is the rate of interest (compounded).

The interest rate per month is $i = 12\% \div 12 = 1\%$, or $12/1200=0.01$ per interest period.

The number n of payments is $5 \text{ years} \times 12 = 60$.

Using all the values in the formula, we get:

$$P = R \times \frac{(1 - (1 + i)^{-n})}{i} = 1000 \times \frac{(1 - (1 + 0.01)^{-60})}{0.01} \approx \$44955.04.$$

Answer: \$44955.04.