

Answer on Question #50992, Economics, Finance

A couple borrows \$10,000 to buy a car. The loan Agreement specifies that monthly payments are to be made for four years. The annual interest rate is 12 percent. Determine the monthly payment.

Solution:

We have the following given data $P = \$10,000$ (initial Principal (loan amount)), $r = 12\%$ (interest rate per period), $n = 12$ month during four month total (number of payments or periods).

Whether we can afford a loan depends on whether we can afford the periodic payment (commonly a monthly payment period). Thus, the most important amortization formula is the calculation of the payment amount per period.

The formula for calculating the payment amount is shown below.

$$A = P \frac{r(1+r)^n}{(1+r)^n - 1}$$

We can substitute the given data to find the monthly payment.

$$A = \$10,000 \cdot \frac{\frac{0.12}{12} \cdot \left(1 + \frac{0.12}{12}\right)^{12 \cdot 4}}{\left(1 + \frac{0.12}{12}\right)^{12 \cdot 4} - 1} = \$10,000 \cdot \frac{0.01 \cdot (1 + 0.01)^{48}}{(1 + 0.01)^{48} - 1} = \$263.338$$

Thus, we can conclude, that if an annual interest rate is 12 percent then the value of monthly payment will be equal to \$263.338.