

# Multipliers Example Sum

Given:

- $N = 12$  (Loan tenure in months)
- Annual interest rate = 20%

First, we need to convert the annual interest rate to a monthly interest rate  $R$ :

$$R = \frac{\text{Annual interest rate}}{12 \times 100}$$

$$R = \frac{20}{12 \times 100}$$

$$R = \frac{20}{1200}$$

$$R = 0.0166667$$

Next, we will use the formula to calculate the multiplier:

$$\text{Multiplier} = \frac{R \times (1+R)^N}{(1+R)^N - 1}$$

Let's plug in the values:

$$\text{Multiplier} = \frac{0.0166667 \times (1+0.0166667)^{12}}{(1+0.0166667)^{12} - 1}$$

We'll calculate this step by step:

1. Calculate  $(1 + R)$ :  
 $1 + R = 1 + 0.0166667 = 1.0166667$
2. Calculate  $(1 + R)^N$ :  
 $(1.0166667)^{12}$
3. Compute the numerator:  
 $R \times (1 + R)^N$
4. Compute the denominator:  
 $(1 + R)^N - 1$
5. Finally, divide the numerator by the denominator to get the multiplier.

I'll now compute these values step by step.

The calculated multiplier, given a loan tenure of 12 months and an annual interest rate of 20%, is approximately 0.0926.

To summarize the calculation steps:

1. Monthly interest rate  $R = 0.0166667$
2.  $(1 + R)^{12} \approx 1.219640089$
3. Numerator:  $R \times (1 + R)^{12} \approx 0.020327335$
4. Denominator:  $(1 + R)^{12} - 1 \approx 0.219640089$
5. Multiplier:  $\frac{0.020327335}{0.219640089} \approx 0.0926$

Therefore, the multiplier is 0.0926. [↔]