

Installment Loans

Buying a House or Car

8.6 & 8.7

If you buy a car or house, the following formula will be used by your lender (probably a bank, but possibly a dealership) to find your monthly payments. I will show you how to **find payments on your graphing calculator**, but if you don't have access to these options, I will explain how to use the formula.

LOAN PAYMENT FORMULA FOR FIXED INSTALLMENT LOANS

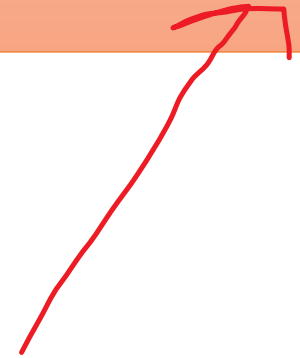
The regular payment amount, PMT , required to repay a loan of P dollars paid n times per year over t years at an annual rate r is given by

$$PMT = \frac{P \left(\frac{r}{n} \right)}{\left[1 - \left(1 + \frac{r}{n} \right)^{-nt} \right]}$$

You can also search '**Loan Calculator**' or '**Payment Calculator**' online and simply input the information and find the payment.

You decide to buy a car that costs \$7,000 and you decide to make a down payment of \$1,000 on it (which means you are financing \$6,000). The dealership says they will offer 6% interest rate over a 4 year period. Then they tell you your payments will be \$165.24. Are they correct?

~~\$~~ / 4091



You decide to buy a car that costs \$7,000 and you decide to make a down payment of \$1,000 on it (which means you are financing \$6,000). The dealership says they will offer 6% interest rate over a 4 year period. Your payment should be \$140.91. Let's see if we get that payment using the formula below.

$$PMT = \frac{P \left(\frac{r}{n} \right)}{\left[1 - \left(1 + \frac{r}{n} \right)^{-nt} \right]}$$

P = Principal (how much you are borrowing)
r = Interest Rate (as a decimal)
n = number of payments per year (usually 12)
t = time (in years)

$$\frac{6000 \left(\frac{.06}{12} \right)}{\left[1 - \left(1 + \frac{.06}{12} \right)^{-12 \cdot 4} \right]}$$

Your uncle just bought a house that cost \$275,000. He made a down payment of \$30,000. How much would his monthly payments be if he received a 4.5% interest rate and the loan was for a 30 year period?

\$245,000

\$1,241.38

Notice the huge difference in what a person pays for a house by financing the house for 15 years instead of 30 years.

Finance \$250,000 for 30 years at 5% interest. The payments will be 1,342.05.

That means 360 payments for a total of \$483,138.

Finance the same home for \$250,000, but for 15 years at 5% interest. The payments will be \$1,976.98.

That means 180 payments for a total of \$355,856.