# The PMT Function in Microsoft Excel
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Excel has a number of built-in functions that allow you to calculate data related to loans. This tutorial explains the basics of the PMT function. For information on the PPMT function, please visit our website at computingatspscc.weebly.com.

## Setting up the PMT Function

The PMT function calculates how much each payment is going to cost for a given loan. To do a PMT, you first need a few pieces of information:

- ✓ the interest rate for the loan
- ✓ the amount of money being loaned
- ✓ the frequency of the loan payments (weekly, monthly, quarterly, yearly, etc.)
- ✓ the duration of the loan payments (i.e. amortization)

Once you have this information, you can begin the PMT function by typing "=PMT(" into the formula bar.
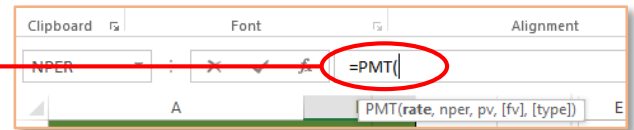


From there, you can either continue to type the formula in the formula bar, or you can click on the function button (fx) to open the PMT dialog box.
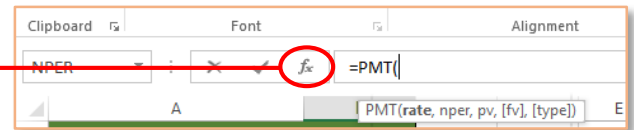


## Parameters of the PMT Function

There are five possible values that can be input into the function. The three in bold are mandatory, while the last two are optional.

(See table on next page for a description of each input value.)
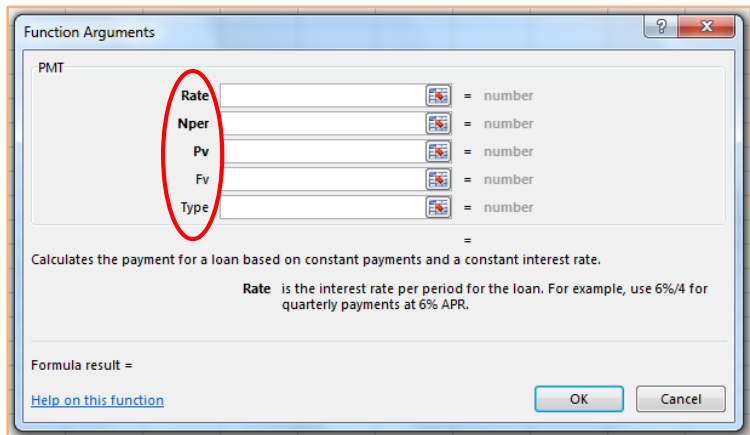
| Name/abbreviation in PMT function | What it means |
|---|---|
| **Rate** | Interest rate for the loan |
| **Nper** | Total number of payments to be made |
| **PV (present value)** | Amount of the loan (i.e. the principal) |
| FV (future value) | Amount you want to have left after final payment |
| Type | Whether payments are made at the beginning or end of the month |

*Required* applies to Rate, Nper, PV. *Optional* applies to FV, Type.

## An example of the PMT Function

Imagine that you are taking out a $200,000 loan at 8% interest that you want to pay off in 18 years through monthly payments.

| | A | B |
|---|---|---|
| 2 | Interest rate | 8% |
| 3 | Amount of loan | $200,000 |
| 4 | Frequency of loan payments | monthly |
| 5 | Duration of loan payments | 18 years |
| 9 | Payment amount | ? |

To calculate what you'd owe each month, you'd input the following figures:

| | | |
|---|---|---|
| Rate | .08/12 | = 0.006666667 |
| Nper | 12*18 | = 216 |
| Pv | 200000 | = 200000 |
| Fv | | = number |
| Type | | = number |
| | | = -1749.925249 |

payment for a loan based on constant payments and a constant interest rate.

Rate is the interest rate per period for the loan. For exampl

a. **Rate** = interest rate percentage divided by 12 (because payments are made monthly and there are 12 months in a year)

b. **Nper** = number of payments (i.e. months) in a year times number of years in the loan

c. **PV** = the original amount of the loan

Click Okay and the PMT function will calculate what you'd owe on a monthly basis (in this case, $1,749.93).

By default, the function assumes that payments will be made at the end of each period (e.g. the last day of each month). If you want to specify that payments are going to be made at the beginning of each period (e.g. the 1ˢᵗ of each month), you will have to insert "1" into the "Type" category:

| Rate | 0.08/12 | | = | 0.006666667 |
| Nper | 12*18 | | = | 216 |
| Pv | 200000 | | = | 200000 |
| Fv | | | = | number |
| Type | 1 | | = | 1 |
| | | | = | -1738.33634 |

the payment for a loan based on constant payments and a constant interest rate.

Type is a logical value: payment at the beginning of the period

## Another Example of the PMT Function

For another example, imagine that you want to calculate payments on a $30,000 loan with 17% interest rate to be paid off in quarterly payments made over 5 years.

| | A | B |
|---|---|---|
| 1 | | |
| 2 | Annual interest rate | 17% |
| 3 | Amount of loan | $30,000 |
| 4 | Frequency of loan payments | quarterly |
| 5 | Duration of loan payments | 5 years |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | Payment amount | |

In this case, "Rate" will be divided by 4 instead of by 12, since they are quarterly rather than monthly payments.

Likewise, "Nper" will be the number of years times 4 rather than times 12.

| Rate | 17%/4 | | = | 0.0425 |
| Nper | 5*4 | | = | 20 |
| Pv | 30000 | | = | 30000 |
| Fv | | | = | number |
| Type | | | = | number |
| | | | = | -2256.595044 |

payment for a loan based on constant payments and a constant interest rate

Leaving "Type" blank as it is here is like entering 0, which means payments will be made at the end of each period.

## Special case: Calculating Savings with FV

The one input value we haven't yet discussed is "FV," which stands for "future value." FV is typically left blank (i.e. set to 0) because people don't want anything left over after all of their loan payments; naturally, they want the value of their loan to have come down to 0 by the time they make their final payment.

However, another way to use FV is to calculate the deposits needed to save a certain amount of money over time.



Imagine that you want to save $1,000 over the course of a year and that your bank has a savings interest rate of .9%.

You can use a PMT function with an FV to find out the weekly payments necessary to reach your savings goal.

Here's what you would enter:

a. **Rate** = savings interest rate divided by the bank's compounding rate (i.e. the number of times per year that the bank compounds interest; in this case, once a month)

b. **Nper** = number of years times number of deposits (i.e. weeks) in a year

c. **PV** = amount of money you are starting with

d. **FV** = amount of money you wish to end with



Within these parameters, the PMT function lets you know that you'd need to deposit $18.87 every week in order to save $1000 over a year.