
Computing Cumulative Interest and Principal Paid For a Calendar Year

Author: **John O. MASON**, Ph.D., CPA, Culverhouse School of Accountancy, The University of Alabama, U.S.A., jomason@cba.ua.edu

This paper demonstrates how easy it is use Microsoft Excel's CUMPRINC and CUMIPMT functions to compute principal and interest paid for an entire year, even though the payments were made monthly. The CUMPRINC function computes the principal paid by a series of loan payments; the CUMIPMT function computes the interest paid. These two functions provide an alternative to preparing a monthly loan amortization schedule and adding up the amounts of monthly interest paid and principal paid for the year.

Keywords: CUMPRINC, CUMIPMT, Microsoft Excel, principal paid, interest paid, Rate, Nper, PV, Start_period, End_period, Type

Microsoft Excel's CUMIPMT and CUMPRINC functions compute the cumulative interest paid and cumulative principal paid, respectively, on an annuity loan between any two periods (i.e., between the i th period and the n th period). For example, you might use the CUMIPMT function to compute the interest paid on a loan during a year in order to determine the interest expense that should appear on a company's income statement. Similarly, you might use the CUMPRINC function to compute the amount of principal that was paid on a loan during a year. This use of the CUMPRINC function would then enable you to compute the note payable balance that should appear on a company's balance sheet at year-end. In addition, you might use the CUMPRINC function to compute the amount of principal that will be paid during the next year in order to determine the portion of the

note payable balance that should be reclassified as a current liability on the balance sheet.


Suppose that early in the year 2013 you accepted an IT consulting engagement with Canyon Maintenance Co., Inc. At a recent board meeting, Diego Fernandez, Canyon's Chief Financial Officer (CFO), informed you about a note payable the company has to a Shannon Smitz, one of Canyon's principal stockholders. Diego noted that Ms. Smitz loaned \$2,500,000 to Canyon at the end of September, 2011, so that Canyon could purchase an office building. He further noted that Ms. Smitz holds a mortgage on the building until the note is paid in full. Diego said that term of the loan is for 20 years, the interest rate is 7.5 percent, and payments are made at the end of each month. Diego noted that the first payment was made on October 31, 2011, and the last payment is scheduled for September 30, 2031. Diego also indicated that Canyon made three payments on the loan during 2011 and that its accounting firm had determined that the note payable balance at December 31, 2011 was \$2,486,370.68.

Diego requests that you to compute the following relative to the note payable so that he can prepare the financial statements for the year ending December 31, 2012:

- Principal paid during 2012 and the Note Payable balance on December 31, 2012;
- Interest paid during 2012;

As a result, you prepare a template similar to the one shown in Figure 1 in a new workbook and save the workbook as NotePay. You decide to use the CUMPRINC function to compute the principal paid during the year 2012, along with the CUMIPMT function to compute the interest paid during that year.

To compute the principal paid during the year 2012, enter the function CUMPRINC as follows in cell C10:

1. Select cell C10 and then click either on the Financial button in the Function Library group of the Formulas tab's Ribbon or on Insert Function button. 
2. If you clicked on the Financial button, then click on the CUMPRINC in the list of financial functions and Excel will display the **Function Arguments** dialog box for that function. If you clicked on the Insert Function button, Excel will display the

- immediately after B19. You should see B19/12 in the Rate box and .00625 to the right of the box.
- Click on the **Nper** box and then click on cell B20. The dialog box displays 10 to the right of the Nper box. Next, with the flashing insertion point positioned after the cell reference B20, convert the annual periods to monthly periods by entering “*12” immediately after B20. You should see B20*12 in the Nper box and 240 monthly periods to the right of the box.
 - Click on the **Pv** box and then click on cell B15. The dialog box displays 2500000 to the right of the Pv box.
 - Click on the **Start_period** box and then click on cell B23. The dialog box displays 4 to the right of the Start_period box.
 - Click on the **End_period** box and then click on cell B24. The dialog box displays 15 to the right of the End_period box.
 - Click on the down arrow at the right side of the dialog box to scroll down to the **Type** box, click on the Type box, and enter zero (0). The dialog box displays 0 to the right of the Type box, indicating an ordinary annuity. Next, the dialog box indicates a cumulative principal paid in the amount of -57137.75525 by payments 4 through 15, as shown in Figure 3.
5. Click on the OK button to enter the CUMPRINC function in cell address C10.

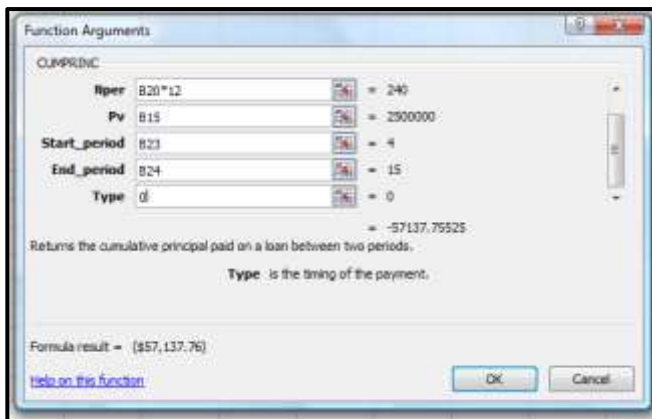


Figure 2: Computing Principal Paid by a Series of Payments with the CUMPRINC Function

View the value displayed in cell C10 and then view the contents of cell C10 on the formula bar. In cell C10, you should see the value (\$57,137.76). On the formula bar, you should see the following CUMPRINC function:

CUMPRINC (B19/12,B20*12,B15,B23,B24,0)

Now compute the interest paid during the year 2012 with the CUMIPMT function. Entering the CUMIPMT function with the Function Arguments dialog box is similar to entering the CUMPRINC function. Select cell E10, click on the Insert Function button, select the Financial category in the Insert Function dialog box, scroll down to the CUMIPMT function, and select it. After selecting the CUMIPMT function, click on the OK button to display the Function Arguments dialog box and enter the arguments. When you have entered all arguments, the Function Arguments dialog box should indicate a cumulative interest paid in the amount of -184540.2028 by payments 4 through 15, as shown in Figure 3. Click on the OK button to enter the CUMIPMT function in cell E10.

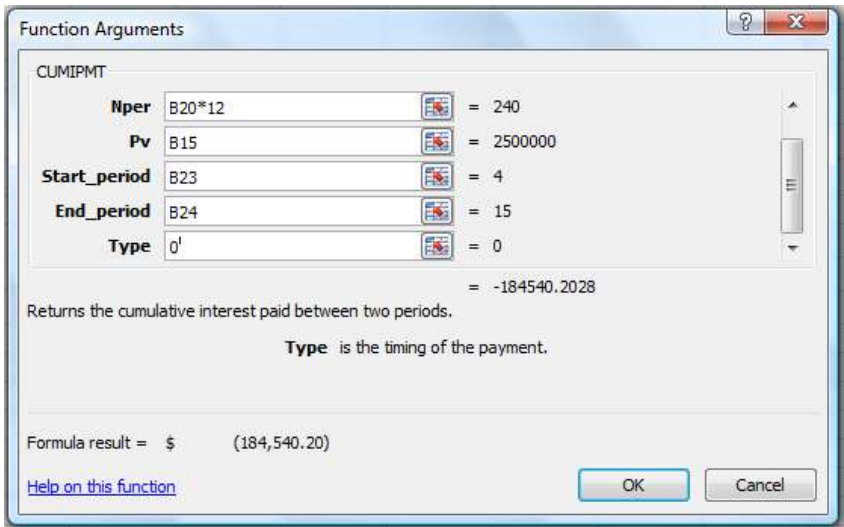




Figure 3: Computing Interest Paid by a Series of Payments with the CUMIPMT Function

Since you want the interest paid in the year 2012 to be a positive value rather than the negative result returned by the CUMIPMT function,

edit the CUMIPMT function in cell E10 by enclosing it within the ABS function, as shown below:

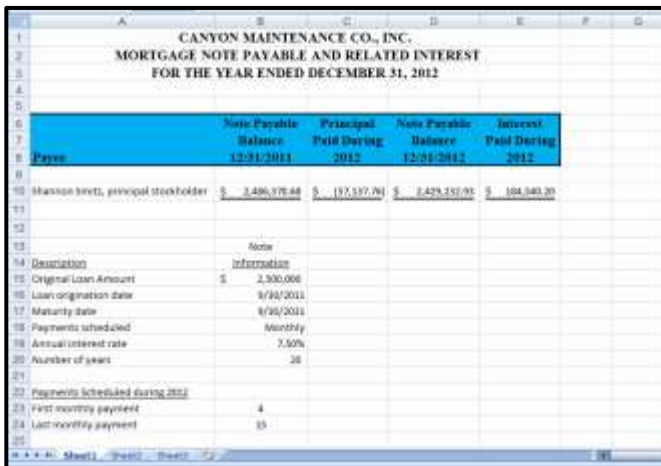
$$= ABS (CUMIPMT (B19/12, B20*12, B15, B23, B24, 0))$$

Complete the worksheet as follows:

1. Compute the note payable balance at December 31, 2012 by entering the following formula in cell D10:
= B10 + C10
2. Format cells C10 through E10 as currency with 2 decimal places by clicking on the \$ symbol in the Home tab's Ribbon. 
3. Similarly, double-accounting underline cells C10 through E10 by clicking on the arrow at the end of the Underline symbol in the Home tab's Ribbon. 

Conclusions

When completed, your worksheet should match that shown in Figure 4. As you can readily see, it is both very fast and very easy to use the CUMIPMT and CUMPRINC functions compute interest and principal paid for an entire year or even longer.



CANYON MAINTENANCE CO., INC. MORTGAGE NOTE PAYABLE AND RELATED INTEREST FOR THE YEAR ENDED DECEMBER 31, 2012				
	Note Payable Balance 12/31/2011	Principal Paid During 2012	Note Payable Balance 12/31/2012	Interest Paid During 2012
Payee				
Shannon Brett, principal stockholder	\$ 2,486,578.68	\$ (87,537.76)	\$ 2,429,157.91	\$ 104,943.20
Note Information				
Description				
Original Loan Amount	\$ 2,500,000			
Loan origination date	8/30/2011			
Maturity date	8/30/2011			
Payments scheduled	Monthly			
Annual interest rate	7.50%			
Number of years	30			
Payments scheduled during 2012				
First monthly payment	4			
Last monthly payment	15			

Figure 4: Completed Cumulative Principal and Interest Worksheet