

Ex. 4 Ms. Mes makes monthly payments on a \$ 72 000 mortgage over 25 years at 11.125% for 5 years. After 2 years, she decides to increase the monthly payment by \$100 and at the end of the 4<sup>th</sup> year she is able to make an extra principal payment of \$ 2000.

a) What is the principal balance owing at the end of 5 yrs? **4 screens needed to complete!**  
*monthly payment*

$$\begin{aligned} N &= 25 \times 12 \\ I\% &= 11.125 \\ PV &= 72\,000 \\ PMT &= * \\ FV &= 0 \\ P/Y &= 12 \\ C/Y &= 2 \\ PMT &: \text{END BEGIN} \end{aligned}$$

*PMT: \$ 699.21*

*Balance remaining after 2 years*

$$\begin{aligned} N &= 2 \times 12 \\ I\% &= 11.125 \\ PV &= 72\,000 \\ PMT &= -699.21 \\ FV &= * \$70\,754.91 \\ P/Y &= 12 \\ C/Y &= 2 \\ PMT &: \text{END BEGIN} \end{aligned}$$

*Bal(24)*

*+\$100 to payment for 2 years*

$$\begin{aligned} N &= 2 \times 12 \\ I\% &= 11.125 \\ PV &= 70\,754.91 \\ PMT &= -799.21 \\ FV &= * \\ P/Y &= 12 \\ C/Y &= 2 \\ PMT &: \text{END BEGIN} \end{aligned}$$

*Balance owing after 4 years.  
\$66 541.22*

~~*Bal(48)*~~

*\$2000 off principal*

$$\begin{aligned} N &= 1 \times 12 \\ I\% &= 11.125 \\ PV &= 66\,541.22 - 2000 \\ PMT &= -799.21 \\ FV &= * \\ P/Y &= 12 \\ C/Y &= 2 \\ PMT &: \text{END BEGIN} \end{aligned}$$

*Balance at end of 5 years \$61 837.82*

b) By how long has the amortization period of the mortgage been shortened?

$$\begin{aligned} N &= * \\ I\% &= 11.125 \\ PV &= 61\,837.82 \\ PMT &= -799.21 \\ FV &= 0 \\ P/Y &= 12 \\ C/Y &= 2 \\ PMT &: \text{END BEGIN} \end{aligned}$$

*N = 133.9*  
*# of years =  $\frac{133.9}{12} = 11.16$  years*

*Faster = 20 - 11.16 = 8.8 years faster*

**Review:**

- Textbook: p. 464 and p. 466
- Handout
- Stations