

**Example 4**

Nadya just bought a house for \$440 000. She had a \$50 000 down payment. The bank offers her a mortgage at 3.55% interest (compounded semi-annually) for 25 years.

- Calculate Nadya's monthly mortgage payment.
- Five years after buying the house, Nadya's term expires. Determine how much money she still owes on her mortgage at this time.
- The bank offers her a new rate of 4% (compounded semi-annually) on the remainder of her mortgage amount amortized over 20 years. Calculate Nadya's new monthly payment.

a)  $N = 25 \times 12$   
 $I = 3.55$   
 $PV = (440000 - 50000) = 390000$   
 $*PMT = -1957.46 \rightarrow$  monthly mortgage payment  
 $FV = 0$   
 $P/Y = 12$   
 $C/Y = 2$

b)  $N = 5 \times 12$   
 $I = 3.55$   
 $PV = 390000$   
 $PMT = -1957.46$   
 $*FV = ? = 336799.29 \leftarrow$  still owing after 5 years  
 $P/Y = 12$   
 $C/Y = 2$

c)  $N = 20 \times 12$   
 $I = 4\%$   
 $PV = 336799.29$   
 $*PMT = ? = 2035.097 \rightarrow$  monthly payments  
 $= 2035.10$   
 $FV = 0$   
 $P/Y = 12$   
 $C/Y = 2$