(1) R = renter
H = homeowner

$$P = \begin{array}{c} \\ R \\ H \end{array}\begin{array}{c} \begin{array}{cc} R & H \end{array} \\ \begin{bmatrix} 0.8 & 0.2 \\ 0.12 & 0.88 \end{bmatrix} \end{array}$$

↑ currently

$$SP = S$$

$$\begin{bmatrix} a & b \end{bmatrix}\begin{bmatrix} 0.8 & 0.2 \\ 0.12 & 0.88 \end{bmatrix} = \begin{bmatrix} a & b \end{bmatrix}$$

$$\begin{bmatrix} 0.8a+0.12b & 0.2a+0.88b \end{bmatrix} = \begin{bmatrix} a & b \end{bmatrix}$$

$0.8a + 0.12b = a \rightarrow -0.2a + 0.12b = 0$

$0.2a + 0.88b = b \rightarrow 0.2a - 0.12b = 0$

$a + b = 1$

$$\begin{array}{c} \begin{array}{cc} a & b \end{array} \\ \left[\begin{array}{cc|c} 1 & 1 & 1 \\ 0.2 & -0.12 & 0 \\ -0.2 & 0.12 & 0 \end{array}\right] \end{array}$$

$$\begin{array}{l} R_2 - 0.2R_1 \\ R_3 + 0.2R_1 \end{array}\left[\begin{array}{cc|c} 1 & 1 & 1 \\ 0 & -0.32 & -0.2 \\ 0 & 0.32 & 0.2 \end{array}\right]$$

$$\begin{array}{l} \frac{R_2}{-0.32} \end{array}\left[\begin{array}{cc|c} 1 & 1 & 1 \\ 0 & 1 & 0.625 \\ 0 & 0.32 & 0.2 \end{array}\right]$$

$$\begin{array}{l} R_1 - R_2 \\ \\ R_3 - 0.32R_2 \end{array}\begin{array}{c} \begin{array}{cc} a & b \end{array} \\ \left[\begin{array}{cc|c} 1 & 0 & 0.375 \\ 0 & 1 & 0.625 \\ 0 & 0 & 0 \end{array}\right] \end{array}$$

$a = 0.375$ or $S = \begin{bmatrix} 0.375 & 0.625 \end{bmatrix}$
$b = 0.625$

(2) $r = 0.03 \quad m = 12 \quad P = ?$

$A = 5000 \quad t = 4$

$$A = P\left(1 + \frac{r}{m}\right)^{mt}$$

$$5000 = P\left(1 + \frac{0.03}{12}\right)^{48}$$

$$P = \frac{5000}{\left(1 + \frac{0.03}{12}\right)^{48}}$$

$$P \approx \$4435.27$$

(3) $PMT = 200 \quad m = 12 \quad t = 5 \quad r = 0.018$

$i = \frac{r}{m} = 0.0015 \quad n = mt = 60$

a) $$FV = PMT \cdot \frac{(1+i)^n - 1}{i}$$

$$= \frac{200\left((1+0.0015)^{60} - 1\right)}{0.0015}$$

$$\approx \$12546.73$$

b) Interest = FV − Total Payments

$$= 12546.73 - 60(200)$$

$$= \$546.73$$

④ $PMT = 200 \quad m = 12 \quad t = 5 \quad r = 0.018$

$i = \frac{r}{m} = 0.0015 \quad n = mt = 60$

a) $PV = PMT \cdot \frac{1-(1+i)^{-n}}{i}$

$= \frac{200\left(1-(1+0.0015)^{-60}\right)}{0.0015}$

$\approx \$11467.62$

b) Interest = Total Payments − PV

$= 60(200) - 11467.62$

$= \$532.38$