Homework – Complete worksheet

## Mortgages: Part 2

Example 1

Consider the scenario from yesterday where a 25 year mortgage for \$220,000 at a quoted interest rate cost \$1041.14/month. What would be the monthly savings and total savings, if Sally had shopped around and found a 25 year mortgage with an interest rate of 2.75%/a instead of 3%/a?

Semi-annual rate $= \frac{0.0275}{2} = 0.01375$

$$\sqrt[6]{(1+i)^6} = \sqrt[6]{1.01375}$$

$$1+i = 1.002278647$$

$$i = 0.002278647$$

$P = 220000$

$R = ?$

$i = 0.002278647$

$n = 25 \times 12 = 300$

$$R = \frac{Pi}{[1-(1+i)^{-n}]}$$

$$= \frac{220000(0.002278647)}{[1-(1.002278647)^{-300}]}$$

$$\doteq \$1013.13/\text{month}$$

Monthly Savings $= 1041.14 - 1013.13$

$= \$28.01/\text{month}$

Total Savings $= 300 \times 28.01$

$\doteq \$8403$

## Example 2

Ashlyn is purchasing a house for $250,000 with no downpayment. Consider two mortgage plans:

Plan 1

➔ 8%/a for the first 10 years
➔ 6%/a for the final 10 years

Plan 2

→ 6%/a for the first 10 years
→ 8%/a for the final 10 years

Which plan is better?

8%/a

$\sqrt[6]{(1+i)^6} = \sqrt[6]{1.04}$

$i = 0.006558197$

6%/a

$\sqrt[6]{(1+i)^6} = \sqrt[6]{1.03}$

$i = 0.004938622$

Plan 1

$R = \frac{Pi}{1-(1+i)^{-n}}$

$= \frac{250000(0.006558197)}{1-(1.006558197)^{-240}}$

$\doteq \$2070.89$/month

time left

$P = \frac{R[1-(1+i)^{-n}]}{i}$

$= \frac{2070.89[1-(1.006558197)^{-120}]}{0.006558197}$

$\doteq \$171657.37$

$R = \frac{Pi}{1-(1+i)^{-n}}$

$= \frac{171657.37(0.004938622)}{1-(1.004938622)^{-120}}$

$\doteq \$1899.41$/month

total $= 120(2070.89) + 120(1899.41)$

$\doteq \$476436$

Plan 2

$R = \frac{Pi}{1-(1+i)^{-n}}$

$= \frac{250000(0.004938622)}{1-(1.004938622)^{-240}}$

$\doteq \$1780.47$/month

$P = \frac{R[1-(1+i)^{-n}]}{i}$

$= \frac{1780.47[1-1.004938622^{-120}]}{0.004938622}$

$\doteq \$160908.64$

$R = \frac{Pi}{1-(1+i)^{-n}}$

$= \frac{160908.64(0.006558197)}{1-(1.006558197)^{-120}}$

$\doteq \$1941.22$/month

total $= 120(1780.47) + 120(1941.22)$

$\doteq \$446603$

~~**Conclusion**~~

## Conclusion

→ It is most important to negotiate a low interest rate on your mortgage for the earliest part of your amortization period.