

Problem Set 4

d) Find balance on loans after 5 years

$$PV = 400,000$$

$$n = 360$$

$$r = 9\%$$

$$PMT = -\$1909.6612$$

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$$n = 360 - 60 = 300$$

$$r = 9$$

$$PV = \$361,790.0525$$

Upfront PMI

$$PV = 400,000 - 2000 - .00974(400,000) - .63(400,000) = \$382,104$$

$$PMT = -\$1909.6612$$

$$n = 60$$

$$FV = -361,790.0525$$

$$r = 5.0607\%$$

Monthly PMI

$$PV = 400,000 - 2000 - .00974(400,000) = \$394,104$$

$$PMT = -1909.6612 + \left(-\frac{.009}{12} * (400,000)\right) = -\$2176.3279$$

$$n = 60$$

$$FV = -\$361,790.0525$$

$$r = 5.1867\%$$

b) Upfront PMI

$$PV = \$382,104$$

$$PMT = -\$1909.6612$$

$$n = 360$$

$$r = 4.3833\%$$

Monthly PMI

$$\text{Months } 1-96 \rightarrow PMT = \$2176.3279$$

$$\text{Months } 97-360 \rightarrow PMT = \$1909.6612$$

Use CF menu

$$CF_0 = 382,104$$

$$CF_1 = -2176.3279$$

$$F_1 = 96$$

$$CF_2 = -1909.6612$$

$$F_2 = 360 - 96 = 264$$

$$IRR = .3829 \times 12 = 4.5953\%$$

With these #'s, upfront PMI is cheaper for both scenarios. Note however that it's advantage shrinks with shorter holding periods.