

Problem Set 1

a) $P/Y = 12$
 $n = 360$
 $r = 4$
 $PV = 400,000(.8) = 320,000$

or

$P/Y = 1$
 $n = 360$
 $r = 4/12$
 $PV = 320,000$

$\Rightarrow PMT = 1527.7289$
 $\Rightarrow PMT = 1527.7289$

b) $n = 180$
 $r = 3.25$
 $PV = 320,000$

$\Rightarrow PMT = 2248.5401$

c) 1st, flexibility. Even though you intend to make the higher payment, you don't have to if something unexpected happens. You have options. 2nd, you may want to do something else with the money.

But there is a cost. The 15 year mortgage will be paid off in 15 years. Even making the 15 year payments, the 30 year mortgage will still have a \$29,152.1645 balance at the end of 15 years (over)

c) continued

$$PV = \$320,000$$

$$PMT = \$2248.5401$$

$$n = 180 \text{ (not } 360 - 180, \text{ but } 180 \text{ for the months paid)}$$

$$r = 9\%$$

$$\text{CPT FV} = -\$29,152.1898$$

d) Remaining balance with reg. payment

$$PMT = \$1527.7289$$

$$n = 180$$

$$r = 4\%$$

$$PV = \$320,000$$

$$\text{CPT FV} = \$206,536.9567$$

Investment

$$PMT = 2248.5401 - 1527.7289 = -\$720.8112$$

$$n = 180$$

$$r = 9\%$$

$$PV = 0 \text{ or blank}$$

$$\text{CPT FV} = \$272,759.1169$$

yes, I can pay off the loan and have

\$66,222.157 left.

c) continued

$$PV = \$320,000$$

$$PMT = \$2248.5401$$

$$n = 180 \text{ (not } 360 - 180, \text{ but } 180 \text{ for the months paid)}$$

$$r = 9\%$$

$$\text{CPT FV} = -\$29,152.1898$$

d) Remaining balance with regular payment

$$PMT = \$1527.7289$$

$$n = 180$$

$$r = 4\%$$

$$PV = \$320,000$$

$$\text{CPT FV} = \$206,536.9587$$

Investment

$$PMT = 2248.5401 - 1527.7289 = -\$720.8112$$

$$n = 180$$

$$r = 9\%$$

$$PV = 0 \text{ or blank}$$

$$\text{CPT FV} = \$272,759.1169$$

yes, I can pay off the loan and have
\$66,222.157 left.

d) Continued

Whether this changes your opinion or not depends on your risk tolerance. You may not actually earn the 9% you expect, but you will definitely pay off the 15 year mortgage if you make those payments.

In fact, you must earn:

$$PMT = -720.8112$$

$$n = 180$$

$$FV = 206,759.1169 \text{ (target amount set equal to remaining loan balance)}$$

$$(CPT r = 5.8382\%)$$

if you want to have exactly enough to pay off your 30 year mortgage in 15 years

So, how confident are you that you can beat 5.8382%?