

## Solutions to the Finance Unit

### Problem Set (Section 6.1)

1) Find the discount on each item if the mark down rate is 5%.

a) \$90.00

$$d = (.05)(90) = \$4.50$$

b) \$25.00

$$d = (.05)(25) = \$1.25$$

c) \$130.00

$$d = (.05)(130) = \$6.50$$

2) Find the discount on each item if the mark down rate is 15%.

a) \$100.00

$$d = (.15)(100) = \$15.00$$

b) \$45.00

$$d = (.15)(45) = \$6.75$$

c) \$140.00

$$d = (.15)(140) = \$21.00$$

3) Find the sale's price on each item given the mark down rate is 20%.

a) \$120.00

$$d = (.20)(120) = \$24.00$$

$$\text{Sale price} = \$120.00 - 24.00 = \$96.00$$

b) \$400.00

$$d = (.20)(400) = \$80.00$$

$$\text{Sale price} = \$400.00 - 80.00 = \$320.00$$

c) \$215.00

$$d = (.20)(215) = \$43.00$$

$$\text{Sale price} = \$215.00 - \$43.00 = \$172.00$$

4) Find the sale's price on each item given the mark down rate is 15%.

a) \$60.00

$$d = (.15)(60) = \$9.00$$

$$\text{Sale price} = \$60.00 - 9.00 = \$51.00$$

b) \$130.00

$$d = (.15)(130) = \$19.50$$

$$\text{Sale price} = \$130 - \$19.50 = \$110.50$$

c) \$15.00

$$d = (.15)(2.25) = \$2.25$$

$$\text{Sale price} = \$15.00 - \$2.25 = \$12.75$$

5) A pair of jeans that has a retail price of \$42.00 is discounted at 25%. What is the sale's price of the jeans?

$$d = (.25)(42) = \$10.50$$

$$\text{Sale price} = \$42.00 - \$10.50 = \$31.50$$

6) A women's dress that has a retail price of \$80 is discounted by 35%. What is the sale's price of the dress?

$$d = (.35)(80) = \$28.00$$

$$\text{Sale price} = \$80.00 - \$28.00 = \$52.00$$

7) The sale price of a television is 200.00. If the mark down is 22%, find the original price of the VCR.

$x = \text{original price}$

$.22x = \text{sale's price}$

$$x - .22x = 200$$

$$.78x = 200$$

$$\frac{.78x}{.78} = \frac{200}{.78}$$

$$x = \$256.41$$

8) The sale price of a laptop computer is \$1100.00. If the mark down is 10%, find the original price of the laptop computer.

$x = \text{original price}$

$.10x = \text{sale's price}$

$$x - .10x = 1100$$

$$.90x = 1100$$

$$\frac{.90x}{.90} = \frac{1100}{.90}$$

$$x = \$1222.22$$

9) Using a mark up rate of 30%, find the retail price given the whole sale price of each item.

a) \$140.00

$$\text{mark up} = (.30)(\$140) = \$42.00$$

$$\text{retail price} = \$140 + \$42.00 = \$182.00$$

b) \$30.00

$$\text{mark up} = (.30)(\$30) = \$9.00$$

$$\text{retail price} = \$30 + \$9.00 = \$39.00$$

c) \$75.00

$$\text{mark up} = (.30)(\$75) = \$22.50$$

$$\text{retail price} = \$75 + \$22.50 = \$97.50$$

10) Using a mark up rate of 45%, find the retail price given the whole sale price of each item.

a) \$200.00

$$\text{mark up} = (.45)(\$200) = \$90.00$$

$$\text{retail price} = \$200 + \$90.00 = \$290.00$$

b) \$34.00

$$\text{mark up} = (.45)(\$34) = \$15.30$$

$$\text{retail price} = \$34 + \$15.30 = \$49.30$$

c) \$124.00

$$\text{mark up} = (.45)(\$124) = \$55.80$$

$$\text{retail price} = \$124 + \$55.80 = \$179.80$$

11) The wholesale price of a pair of dress pants is \$25.00. If the jeans are marked up by 60%, what is the retail price of the pants?

$$\text{mark up} = (.60)(\$25) = \$15.00$$

$$\text{retail price} = \$25.00 + \$15.00 = \$40.00$$

12) The wholesale price of a CD player is \$57.00. If the CD player is marked up by 30%, what is the retail price of the CD player?

$$\text{mark up} = (.30)(\$57.00) = \$17.10$$

$$\text{retail price} = \$57.00 + \$17.10 = \$74.10$$

13) The retail price of a pair of dress pants is \$70.00. If the jeans are marked up by 25%, what is the whole sale price of the pants?

$$x = \text{retail price}$$

$$.25x = \text{whole sale price}$$

$$x + .25x = 70$$

$$1.25x = 70$$

$$\frac{1.25x}{1.25} = \frac{70}{1.25}$$

$$x = \$56$$

14) The retail price of a new television that has been mark up by 55% is \$420.00. Find the whole sale price of the television.

$$x = \text{retail price}$$

$$.55x = \text{whole sale price}$$

$$x + .55x = 420$$

$$1.55x = 420$$

$$\frac{1.55x}{1.55} = \frac{420}{1.55}$$

$$x = \$270.97$$

15) The sale's tax rate in North Carolina is 4.5%. Find the total cost including sale's tax for purchasing each item.

a) \$150.00

$$\text{State Sale's tax} = .045(150.00) = \$6.75$$

$$\text{Cost including tax} = \$150.00 + \$6.75 = \$156.75$$

b) \$340.00

$$\text{State Sale's tax} = .045(340.00) = \$15.30$$

$$\text{Cost including tax} = \$340.00 + \$15.30 = \$355.30$$

16) The sale's tax rate in Michigan is 6%. Find the total cost including sale's tax for purchasing each item.

a) \$250.00

$$\text{State Sale's tax} = (.06)(250.00) = \$15.00$$

$$\text{Cost including tax} = \$250.00 + \$15 = \$265.0$$

b) \$420.00

$$\text{State Sale's tax} = (.06)(420.00) = \$25.20$$

$$\text{Cost including tax} = \$420.00 + \$25.20 = \$445.20$$

### Problem Set (Section 6.2)

Complete the following chart

Interest	Principle	Rate	Time
1) \$262.50	\$1500	3.5%	5 years
2) \$50	\$190	5%	5.3 years
3) \$100	\$1500	1.33%	5 years
4) \$4248.75	\$15,450	$2\frac{3}{4}\%$	10 years
5) \$1000	\$25,000	.8%	5 years

### Simple Interest

6) How much interest is earned if \$4200 is put in a savings account that pays 1.5% interest for 4 years?

$$I = (4200)(.015)(4) = \$252.00$$

7) You borrow \$10000 from a bank that has a 9.4% interest rate for 5 years. How much simple interest do you owe the bank?

$$I = (10000)(.094)(5) = \$4700.00$$

8) You borrow \$25000 from a bank that has a 10.5% interest rate for 5 years. How much simple interest do you owe the bank?

$$I = (25000)(.105)(5) = \$13,125.00$$

## Future Value

9) If \$23,500 is deposited in a saving account with a simple interest rate of 1.3%, what is the future value in 10 years?

$$A = P(1 + RT) = 23,500(1 + .013(10)) = 23,500(1 + .13) = 23,500(1.13) = \$26555$$

10) If \$1,900 is deposited in a saving account earning 2.5 % simple interest, what is the future value in 4 years?

$$A = P(1 + RT) = 1,900(1 + .025(4)) = 1,900(1 + .10) = 1,900(1.10) = \$2,090$$

11) If a business borrows \$100,000 and repays \$126,100 in 4 years, what is the simple interest rate?

$$126,000 = 100,000(1 + 4R)$$

$$126,000 = 100,000 + 400,000R$$

$$126,000 - 100,000 = 100,000 - 100,000 + 400,000R$$

$$26,000 = 400,000R$$

$$R = 0.065 \text{ or } 6.5\%$$

12) If you borrow \$10,000 from the bank and repay the bank \$12,500 in 5 years, what is the simple interest rate?

$$12,500 = 10,000(1 + 5R)$$

$$12,500 = 10,000 + 50,000R$$

$$12,500 - 10,000 = 10,000 - 10,000 + 50,000R$$

$$2,500 = 50,000R$$

$$R = 0.05 \text{ or } 5\%$$

13) Suppose you wish to save \$5,750. If you have \$5000 and invest it at a 2% simple interest rate, how long will it take to obtain \$5,750?

$$5,700 = 5,000(1 + .02T)$$

$$5,700 = 5,000 + 100T$$

$$5,700 - 5,000 = 5,000 - 5,000 + 100T$$

$$700 = 100T$$

$$T = 7 \text{ years}$$

### Problem Set (Section 6.3)

#### Find the missing value

1) Given  $P = \$10,000$ ,  $R = .03$ ,  $n = 4$ ,  $T = 10$ , Find  $A = ?$

$$A = P\left(1 + \frac{r}{n}\right)^{nt} = \$10,000\left(1 + \frac{.03}{4}\right)^{4(10)} = \$10,000(1 + 0.0075)^{40} = \$10,000(1.0075)^{40} = \$13,483.49$$

2) Given  $P = \$17,000$ ,  $R = .06$ ,  $n = 2$ ,  $T = 5$ , Find  $A = ?$

$$A = P\left(1 + \frac{r}{n}\right)^{nt} = \$17,000\left(1 + \frac{.06}{2}\right)^{2(5)} = \$17,000(1 + 0.03)^{10} = \$17,000(1.03)^{10} = \$22,846.58$$

3) Given  $P = \$7,000$ ,  $R = .01$ ,  $n = 12$ ,  $T = 10$ , Find  $A = ?$

$$A = P\left(1 + \frac{r}{n}\right)^{nt} = \$7,000\left(1 + \frac{.01}{12}\right)^{12(10)} = \$7,000(1 + 0.000833)^{120} = \$7,000(1.000833)^{120} = \$7,735.87$$

4) Given  $A = \$10,000$ ,  $R = .04$ ,  $n = 12$ ,  $T = 10$ , Find  $P = ?$

$$\begin{aligned} 10,000 &= P\left(1 + \frac{.04}{12}\right)^{12(10)} \\ 10,000 &= P(1 + .00333333)^{120} \\ 10,000 &= P(1.00333333)^{120} \\ 10,000 &= 1.4908P \\ P &= \$6,707.81 \end{aligned}$$

5) Given  $A = \$20,000$ ,  $R = .03$ ,  $n = 12$ ,  $T = 5$ , Find  $P = ?$

$$\begin{aligned} 20,000 &= P\left(1 + \frac{.03}{12}\right)^{12(5)} \\ 20,000 &= P(1 + .0025)^{60} \\ 20,000 &= P(1.0025)^{60} \\ 20,000 &= 1.16161P \\ P &= \$17,217.39 \end{aligned}$$

6) Given  $P = \$30,000$ ,  $R = .012$ ,  $n = 4$ ,  $T = 6$ , Find  $A = ?$

$$A = P \left( 1 + \frac{r}{n} \right)^{nt} = \$30,000 \left( 1 + \frac{.012}{4} \right)^{4(6)} = \$30,000(1 + 0.003)^{24} = \$30,000(1.003)^{24} \\ = \$32,236.19$$

7) Given  $P = \$10,000$ ,  $R = .03$ ,  $n = 4$ ,  $A = \$14,000$ ,  $T = ?$

$$A = P \left( 1 + \frac{R}{n} \right)^{nt}$$

$$14,000 = 10,000 \left( 1 + \frac{.03}{4} \right)^{4t}$$

$$14,000 = 10,000(1 + .0075)^{4t}$$

$$14,000 = 10,000(1.0075)^{4t}$$

$$\frac{14,000}{10,000} = \frac{10,000(1.0075)^{4t}}{10,000}$$

$$1.4 = (1.0075)^{4t}$$

$$\log(1.4) = \log(1.0075)^{4t}$$

$$\log(1.4) = 4t \log(1.0075)$$

$$.1461 = 4t(.003245)$$

$$.1461 = .01298t$$

$$t = \frac{.1461}{.01298}$$

$$t \approx 11 \text{ years}$$

8) Given  $P = \$12,000$ ,  $R = .01$ ,  $n = 365$ ,  $A = \$20,000$ ,  $T = ?$

$$20,000 = 12,000 \left( 1 + \frac{.01}{365} \right)^{365t}$$

$$20,000 = 12,000(1.0000274)^{365t}$$

$$1.667 = (1.0000274)^{365t}$$

$$\log(1.667) = \log(1.0000274)^{365t}$$

$$\log(1.667) = 365t \log(1.0000274)$$

$$.21 = 365t(.000019)$$

$$.1218 = .006935t$$

$$t \approx 18 \text{ years}$$

## Saving Accounts

- 9) Mark puts \$30,000 in a saving account that compound interest quarterly at 2% for 5 years. What will be the balance in Mark account after 5 years?

$$A = \$30,000 \left( 1 + \frac{.02}{4} \right)^{4(5)} = \$30,000(1.005)^{20} = \$33146.87$$

- 10) Marcia invest \$1000 in a saving account that compound interest monthly for 3 years at a rate of 3% per year. How much money will she have in the bank after 3 years?

$$A = \$1,000 \left( 1 + \frac{.03}{12} \right)^{12(3)} = \$1,000(1.0025)^{36} = \$1094.05$$

- 11) If you leave \$16,000 in an account that earns 4% interest, compounded daily, how much money would be in the account after 5 years?

$$A = \$16,000 \left( 1 + \frac{.04}{365} \right)^{365(5)} = \$16,000(1.0001096)^{1825} = \$19,542.62$$

- 12) How money would \$18,500 earn in 10 years if the saving account compounds interest monthly at a rate of 2.3% per year?

$$A = \$18,500 \left( 1 + \frac{.023}{12} \right)^{10(12)} = \$18,500(1.0019166)^{120} = \$23,278.98$$

## Saving Bonds

- 13) If you invest \$20,000 in a saving bond that compounds interest monthly at a rate of 5% per year for 10 years, how much money will be in the saving bond after 10 years?

$$A = \$20,000 \left( 1 + \frac{.05}{12} \right)^{12(10)} = \$20,000(1.0041667)^{120} = \$32,940.19$$

14) If Juan invests \$30,000 in a saving bond that compounds interest monthly at a rate of 8% per year for 5 years, how much money will be in the saving bond after 5 years?

$$A = \$30,000 \left( 1 + \frac{.08}{12} \right)^{12(5)} = \$30,000(1.00667)^{60} = \$44695.19$$

15) How much money will be in a saving bond after 20 years if you would invest \$2,000 in a saving bond plan that compounds interest monthly at rate of 8.5 % per year?

$$A = \$2,000 \left( 1 + \frac{.085}{12} \right)^{12(20)} = \$2,000(1.0070833)^{240} = \$10882.49$$

16) A special saving bond earns 9% interest. How much money would be in a saving bond after 10 years if \$25,000 is invested in a saving bond that compounds interest quarterly?

$$A = \$25,000 \left( 1 + \frac{.09}{12} \right)^{12(10)} = \$25,000(1.0075)^{120} = \$61283.93$$

### Computing Time

17) How much time would it take \$14,000 to accumulate to \$20,000 in a saving account that compounds interest quarterly at 1.5% per year?

$$20,000 = 14,000 \left( 1 + \frac{.015}{4} \right)^{4t}$$

$$20,000 = 14,000(1.00375)^{4t}$$

$$1.4286 = (1.00375)^{4t}$$

$$\log(1.4286) = \log(1.00375)^{4t}$$

$$\log(1.4286) = 4t \log(1.00375)$$

$$.1594 = 4t(.001626)$$

$$.1594 = .0065t$$

$$t \approx 24.5 \text{ years}$$

18) How much time would it take \$15,000 to grow to an accumulated balance of \$25,000 in a saving bond that compounds interest quarterly at 1.5% per year?

$$25,000 = 15,000 \left( 1 + \frac{.015}{4} \right)^{4t}$$

$$25,000 = 15,000(1.00375)^{4t}$$

$$1.667 = (1.00375)^{4t}$$

$$\log(1.667) = \log(1.00375)^{4t}$$

$$\log(1.667) = 4t \log(1.00375)$$

$$.2219 = 4t(.001626)$$

$$.2219 = .006502t$$

$$t \approx 34 \text{ years}$$

**Complete the following chart on compound interest**

Principle	Interest rate	Time	Number times compounded in a year (n)	New Balance
19) \$5,600	2%	5 yr	n = 12	\$6188.44
20) \$12,000	8.6%	3 years	n = 4	\$15,000
21) \$30,000	7.6%	10 yr	n = 365	\$64143.21

**Problem Set (Section 6.4)**

1) Find the loan payment given  $P = \$130,000, t = 15, r = 9\%$

$$PMT = \frac{(\$130,000)\left(\frac{.09}{12}\right)}{1 - \left(1 + \frac{.09}{12}\right)^{-12(15)}} = \frac{(\$130,000)(.0075)}{1 - (1 + .0075)^{-180}} = \frac{\$975}{1 - (1.0075)^{-360}} = \frac{\$975}{1 - .26055} = \frac{\$975}{.73945} = \$1318.56$$

2) Find the loan payment given  $P = \$10,000, t = 5, r = 10\%$

$$PMT = \frac{(\$10,000)\left(\frac{.10}{12}\right)}{1 - \left(1 + \frac{.10}{12}\right)^{-12(5)}} = \frac{(\$10,000)(.008333)}{1 - (1 + .008333)^{-60}} = \frac{\$83.33}{1 - (1.008333)^{-60}} = \frac{\$83.33}{1 - .60779} = \frac{\$83.33}{.39221} = \$212.46$$

3) Find the loan payment given  $P = \$3,000, t = 5, r = 6\%$

$$PMT = \frac{(\$3,000)\left(\frac{.06}{12}\right)}{1 - \left(1 + \frac{.06}{12}\right)^{-12(5)}} = \frac{(\$3,000)(.005)}{1 - (1 + .005)^{-60}} = \frac{\$18}{1 - (1.005)^{-60}} = \frac{\$18}{1 - .74137} = \frac{\$18}{.25863} = \$69.60$$

4) Find the amount of the loan given  $PMT = \$340, t = 5, r = 6\%$

$$P = PMT \left[ \frac{1 - \left(1 + \frac{r}{n}\right)^{-nt}}{\frac{r}{n}} \right] = \$340 \left[ \frac{1 - \left(1 + \frac{.06}{12}\right)^{-12(5)}}{\frac{.06}{12}} \right] = \$340 \left[ \frac{1 - (1 + .005)^{-60}}{.005} \right] = \$340 \left[ \frac{1 - (1.005)^{-60}}{.005} \right]$$

$$= \$340 \left[ \frac{1 - .74137}{.005} \right] = \$340(51.72556) = \$17,586.69$$

5) Find the amount of the loan given  $PMT = \$840, t = 30, r = 6\%$

$$P = PMT \left[ \frac{1 - \left(1 + \frac{r}{n}\right)^{-nt}}{\frac{r}{n}} \right] = \$840 \left[ \frac{1 - \left(1 + \frac{.06}{12}\right)^{-12(30)}}{\frac{.06}{12}} \right] = \$840 \left[ \frac{1 - (1 + .005)^{-360}}{.005} \right] = \$840 \left[ \frac{1 - (1.005)^{-360}}{.005} \right]$$

$$= \$840 \left[ \frac{1 - .16604}{.005} \right] = \$840(166.7916) = \$140,104.96$$

6) What would your monthly house payment be on \$136,000 town home if you finance the house for 30 years at an interest rate of 6%?

$$PMT = \frac{(\$136,000) \left( \frac{.06}{12} \right)}{1 - \left(1 + \frac{.06}{12}\right)^{-12(30)}} = \frac{(\$136,000)(.005)}{1 - (1 + .005)^{-360}} = \frac{\$680}{1 - (1.005)^{-360}} = \frac{\$680}{1 - .16604} = \frac{\$680}{.83396} = \$815.39$$

7) What would your monthly house payment be on \$240,000 house if you finance the house for 30 years at an interest rate of 8%?

$$PMT = \frac{(\$240,000) \left( \frac{.08}{12} \right)}{1 - \left(1 + \frac{.08}{12}\right)^{-12(30)}} = \frac{(\$240,000)(.0066667)}{1 - (1 + .0066667)^{-360}} = \frac{\$1600}{1 - (1.0066667)^{-360}} = \frac{\$1600}{1 - .09144} = \frac{\$1600}{.90856} = \$1761.03$$

8) What would your monthly car payment be on Honda Accord that cost \$23,000 if you finance the car for 5 years at an interest rate of 12%?

$$PMT = \frac{(\$23,000) \left( \frac{.12}{12} \right)}{1 - \left(1 + \frac{.12}{12}\right)^{-12(5)}} = \frac{(\$23,000)(.01)}{1 - (1 + .01)^{-60}} = \frac{\$230}{1 - (1.01)^{-60}} = \frac{\$230}{1 - .55045} = \frac{\$230}{.44955} = \$511.62$$

9) What would be the payment on a \$55,000 motorboat if the motorboat can be financed for 15 years at an interest rate on 9.5% per year?

$$PMT = \frac{(\$55,000)\left(\frac{.095}{12}\right)}{1 - \left(1 + \frac{.095}{12}\right)^{-12(15)}} = \frac{(\$55,000)(.0079167)}{1 - (1 + .0079167)^{-180}} = \frac{\$435.42}{1 - (1.0079167)^{-360}} = \frac{\$435.42}{1 - .24186} = \frac{\$435.42}{.75814} = \$574.27$$

10) The available interest rate on a \$17,000 Pontiac Sunbird is 9% per year. Compare the monthly payments for a 3 year loan and 5 year loan, and then determine which loan the 3 year or 5 year pays the least amount of interest.

3 year loan

$$PMT = \frac{(\$17,000)\left(\frac{.09}{12}\right)}{1 - \left(1 + \frac{.09}{12}\right)^{-12(3)}} = \frac{(\$17,000)(.0075)}{1 - (1 + .0075)^{-36}} = \frac{\$127.50}{1 - (1.0075)^{-36}} = \frac{\$127.50}{1 - .76415} = \frac{\$127.50}{.23585} = \$540.60$$

5 year loan

$$PMT = \frac{(\$17,000)\left(\frac{.09}{12}\right)}{1 - \left(1 + \frac{.09}{12}\right)^{-12(5)}} = \frac{(\$17,000)(.0075)}{1 - (1 + .0075)^{-60}} = \frac{\$127.50}{1 - (1.0075)^{-60}} = \frac{\$127.50}{1 - .63870} = \frac{\$127.50}{.36130} = \$352.89$$

Interest paid on the 3 year loan

$$36(\$540.60) = \$19,461.60$$

$$\$19,461.60 - \$17,000 = \$2,461.60$$

Interest paid on the 5 year loan

$$60(\$352.89) = \$21,173.40$$

$$\$21,173.40 - \$17,000 = \$4,173.40$$

11) The available interest rate on a \$195,000 house is 6% per year. Compare the monthly payments for a 30 year loan and 15 year loan, and then determine which loan the 30 year or 15 year pays the least amount of interest.

30 – year

$$PMT = \frac{(\$195,000)\left(\frac{.06}{12}\right)}{1 - \left(1 + \frac{.06}{12}\right)^{-12(30)}} = \frac{(\$195,000)(.005)}{1 - (1 + .005)^{-360}} = \frac{\$975}{1 - (1.005)^{-360}} = \frac{\$975}{1 - .166041} = \frac{\$975}{.833959} = \$1169.12$$

15 – year

$$PMT = \frac{(\$195,000)\left(\frac{.06}{12}\right)}{1 - \left(1 + \frac{.06}{12}\right)^{-12(15)}} = \frac{(\$195,000)(.005)}{1 - (1 + .005)^{-180}} = \frac{\$975}{1 - (1.005)^{-180}} = \frac{\$975}{1 - .40748} = \frac{\$975}{.5925176} = \$1646.47$$

Total amount of the 30 year loan

$$360(\$1169.12) = \$420883.12$$

Interest Paid

$$\$420,883.12 - \$195,000 = \$225,883.12$$

Total amount of the 15 year loan

$$180(\$1646.47) = \$296,364.6$$

Interest Paid

$$\$296,364.60 - \$195,000 = \$101,364.60$$

The 30 year loan payments are less than the 15 year loan. However, the 15 year loan pays much less interest than the 30 year loan.

12) The available interest rate on a \$290,000 house is 8% per year. Compare the monthly payments for a 30 year loan and 15 year loan, and then determine which loan the 30 year or 15 year pays the least amount of interest.

30 – year

$$PMT = \frac{(\$290,000)\left(\frac{.08}{12}\right)}{1 - \left(1 + \frac{.08}{12}\right)^{-12(30)}} = \frac{(\$290,000)(.0066667)}{1 - (1 + .0066667)^{-360}} = \frac{\$1933.33}{1 - (1.0066667)^{-360}} = \frac{\$1933.33}{1 - .91443} = \frac{\$1933.33}{.08556} = \$2127.91$$

15 – year

$$PMT = \frac{(\$290,000)\left(\frac{.08}{12}\right)}{1 - \left(1 + \frac{.08}{12}\right)^{-12(15)}} = \frac{(\$290,000)(.0066667)}{1 - (1 + .0066667)^{-180}} = \frac{\$1933.33}{1 - (1.0066667)^{-180}} = \frac{\$1933.33}{1 - .30239} = \frac{\$1933.33}{.69761} = \$2771.38$$

Total amount of the 30 year loan

$$360(\$2127.91) = \$766,047.60$$

Interest Paid

$$\$766,047.60 - \$290,000 = \$476,047.60$$

Total amount of the 15 year loan

$$180(\$2771.38) = \$498,848.40$$

Interest Paid

$$\$498,848.40 - \$290,000 = \$208,848.40$$

The 30 year loan payments are less than the 15 year loan. However, the 15 year loan pays much less interest than the 30 year loan.

13) What would be your monthly car payment be on car that cost 12,600 if you finance the car for 5 years at an interest rate of 6%?

$$PMT = \frac{(\$12,600)\left(\frac{.06}{12}\right)}{1 - \left(1 + \frac{.06}{12}\right)^{-12(5)}} = \frac{(\$12,600)(.005)}{1 - (1 + .005)^{-60}} = \frac{\$63}{1 - (1.005)^{-60}} = \frac{\$63}{1 - .74137} = \frac{\$63}{.25863} = \$243.59$$

14) Mike purchases a Porsche for \$42,300 and finances the entire amount at a rate of 8.5% per year for 5 years. What would be Mike's car payments?

$$PMT = \frac{(\$42,300)\left(\frac{.085}{12}\right)}{1 - \left(1 + \frac{.085}{12}\right)^{-12(5)}} = \frac{(\$42,300)(.0070833)}{1 - (1 + .0070833)^{-60}} = \frac{\$299.625}{1 - (1.0070833)^{-60}} = \frac{\$299.625}{1 - .65475} = \$867.85$$