

Math 111 Finance Worksheet E

1. Managing Debt: Purchasing a Car.

- (a) Suppose that you are going to finance the purchase of a new \$21,000 car. There are three financing options available to you: 1.9% financing for 3 years, 3.9% financing for 4 years, or 5.9% financing for 5 years. Compare the financing costs for each of the three loans. Which would be best for you and why?

N= 36 I%= 1.9 PV= 21000 PMT= FV= 0 P/Y= 12 C/Y= 12 PMT: <input type="checkbox"/> END <input type="checkbox"/> BEGIN	N= 48 I%= 3.9 PV= 21000 PMT= FV= 0 P/Y= 12 C/Y= 12 PMT: <input type="checkbox"/> END <input type="checkbox"/> BEGIN	N= 60 I%= 5.9 PV= 21000 PMT= FV= 0 P/Y= 12 C/Y= 12 PMT: <input type="checkbox"/> END <input type="checkbox"/> BEGIN
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\$21,000 Car Loan			
Loan Term	3 Years (1.9%)	4 Years (3.9%)	5 Years (5.9%)
Monthly Payments	\$200.58		
Total Number of Payments	36	48	60
Total payout during the term	21620.88		
Cost to Finance - Interest	620.88		

- (b) Paige is offered two options when purchasing a new \$17,000 car. Option 1 offers 6.75% financing for 4 years and \$2500 "cash back." Option 2 offers 4.75% financing for 5 years with no cash back. The financing requires monthly payments. Find the monthly payment for each financing option. Assume that the cash back in Option 1 will be used to reduce the amount of the original loan. If Paige's goal is to pay the minimum amount for financing over the life of the loan, which option should she choose? Explain why using specific numbers.

N= 48
I%= 6.75
PV= 17000 - 2500 = 14500
PMT=
FV= 0
P/Y= 12
C/Y= 12
PMT: END BEGIN

\$ 345.54 / mo
total cost
\$ 16585.92

N= 60
I%= 4.75
PV= 17000
PMT=
FV= 0
P/Y= 12
C/Y= 12
PMT: END BEGIN

\$ 318.87 / mo
\$ 19132.20

2. Explorations:

- (a) In problem (b), assume Option 2 offers 4.5% financing. Now which option is best?
 (b) In problem (b), how much cash back should be offered so that the total amount spent on the car at the end of the terms is equal?

3. Managing Debt: Leasing a Car

Which vehicle should you lease? The typical term on a lease is 3 years. To determine the cost of the lease, a residual value is used. The residual value is essentially the proportion of the vehicle's original value that the vehicle will be worth in 3 years. (That is a measure of depreciation.)

N= 36
I%= 8
PV= 21011
PMT=
FV= 0
P/Y= 12
C/Y= 12
PMT: <u>END</u> BEGIN

N= 36
I%= 8
PV= 37695
PMT=
FV= 0
P/Y= 12
C/Y= 12
PMT: END BEGIN

	Dodge Caravan	Toyota Sienna
List Price	\$21,011	\$37,695
8% 3-year loan pymt	\$658.41	\$1,181.22
Total Payments	$(\$658.41)(36) = \$23,702.76$	$(\$1,181.22)(36) = \$42,523.92$
Residual	31.8%	60%
Residual Value	$(\$21,011)(.318) = \$6,681.50$	$(\$37,695)(.60) = \$22,617$
Total Cost	$\$23,702.76 - \$6,681.50 =$ $\$17,021.26$	$\$42,523.92 - \$22,617 = \$19,906.92$
Cost per Month	$\$17,021.26/36 = \472.81	$\$19,906.92/36 = \552.97

Repeat the above calculations to determine which car has the lowest cost to own.

	Chevy Cavalier	Toyota Camry
List Price	\$17,510	\$29,650
8% 3-year loan pymt	548.70	
Total Payments	19759.70	
Residual	26.3% of MSRP	63%
Residual Value	4604.13	
Total Cost	15149.07	
Cost per Month	\$420.81/mo	\$410.25/mo

4. Explorations:

- Compare the "cost to own" of the two cars below. Which one has the lowest "cost to own?"

	Car 1	Car 2
List Price	\$23,810	\$32,950
8% 3-year loan pymt	796.12/mo	1032.53
Total Payments	26860.32	37171.08
Residual	35.7%	57.9%
Residual Value	8500.17	19078.05
Total Cost	18360.15	18093.03
Cost per Month	\$510.00/mo	\$502.58/mo

5. Managing Debt: Paying Off a Credit Card

Dell has advertised a Dimension E521 computer for \$1149 (\$1218 after tax) or \$35 per month. You are in need of a new computer and this model seems to satisfy all of your needs. Suppose that you pay only the minimum due of \$35 (at 19.99% APR) each month on your new computer.

(a) How long will it take you to pay off the computer? How much will you have paid on the \$1218 balance when the computer is finally paid off?

N=	50.07
I%=	19.99%
PV=	1218
PMT=	-35
FV=	0
P/Y=	12
C/Y=	1
PMT:	END BEGIN

The PC will cost
a total of \$1752.45

(b) Suppose your friend purchases the same computer and has the same beginning balance or \$1218. Because your friend has bad credit, the annual interest rate is 29.99%. How long will it take your friend to pay off the computer? How much will your friend have paid on the \$1218 balance when the computer is finally paid off?

* N=	67.04
I%=	29.99
PV=	1218
PMT=	-35
FV=	0
P/Y=	12
C/Y=	1
PMT:	END BEGIN

They will pay
\$2346.40 for
the PC.

Note: 29.99% APR
= 26.52% compounded
monthly.

6. Explorations

(a) How much would you need to invest in a sinking fund each month at 5% interest compounded monthly to accumulate the \$1218 needed to purchase the computer in 2 years?

\$48.36 saved
per month.

(b) How many months would it take to accumulate the \$1218 needed to purchase the computer if you invest \$35 in a sinking fund earning 5% interest?

OR save \$35/mo
for 33 months...

