Midterm #2 Financial Functions Practice Annotated Answers

REMEMBER: Ignore negatives and round ansers to the nearest dollar; will explain why in subsequent weeks.

If you understand these problems, you'll do great on the midterm.

#1 Output = FV "how much will have been saved at retirement" **NOTICE: PER year = PMT**

($732,718)

Inputs: n = 50 (80-30); PMT = $3,500 ("per year"); rate = 5% PV = 0 ("no savings or debt")

#2A BOTH Output = PV "Present Value of Option One"

OPTION ONE Inputs: PMT = $30,000 ("per year"); n = 15; rate = 7% **NOTICE: PER year = PMT**

($273,237)

#2B

OPTION TWO Inputs: FV = $450,000 "lump sum in 10 years"; n =10; rate = 7%

($228,757)

#2C **OPTION ONE HAS A HIGHER PRESENT VALUE & IS THE BEST OPTION.**

#3 Output = PMT "monthly payment" **REMEMBER: FOR ALL LOANS, DO MONTHLY**

($2,501)

Inputs: PV = $550,000 (loan amount); rate = 3.6%/12; n = 30*12

#4 Output = PMT ". . .must be saved each year . . ." **NOTICE: EACH YEAR = PMT**

($5,804)

Inputs: FV = $1,400,000 ("savings goal"); n = 45 (70 - 25); PV = - $12,000 ("presently have savings of");
rate = 6%. **NOTICE: "Savings" input as negative $12,000.**

#5 Output = PV "how much should an investor pay" **NOTE: INVESTMENT VALUES = PV**

($35,808)

Inputs: FV = $40,000 (face value); PMT = $1,900 per year; rate = 6%; n = 12 years.

#6 Output = PV "how much should an investor pay" **NOTE: INVESTMENT VALUES = PV**

($16,094)

Inputs: FV = $50,000 (face value); rate = 6.5%; n = 18 years

#7 Output = PV "how much can you borrow", loan amount

($447,602)

Inputs: PMT = $125,000 per year * 32% / 12;
rate = 4.1%/12; n = 15*12

NOTE: *35% allocates annual income to annual payment
Dividing by 12 converts annual payment to monthly payment

#8 Output = PMT ("must be saved each year")

NOTICE: EACH YEAR = PMT

($3,298)

Inputs: FV = $1,300,000 ("savings goal"); rate = 6%; n = 55 (75-20)

#9 Output = FV "will have been saved at retirement"

Note: Student loan is a liability, input as negative value

($424,270)

Inputs: PMT = $5,000 ("per year"); PV = -$25,000 ("student loan"); rate = 7%; n = 35 (65 - 30)

#10

One Bedroom Unit Monthly Rent = $900 **X 11 units X 12 months (1st Year Income For One Bedroom Units)**
Two Bedroom Unit Monthly Rent = $1,400 **X 7 units X 12 months (1st Year Income For Two Bedroom Units)**

	Year 1	Year 2	Year 3	Year 4	
Annual Gross Income					
One Bedroom Units	$118,800	$127,116	$136,014	**$145,535**	**Increase each year gross income 7% by multiplying by 1.07**
Two Bedroom Units	$117,600	$125,832	$134,640	**$144,065**	**Increase each year gross income 7% by multiplying by 1.07**
Total Annual Gross Income	$236,400	$252,948	$270,654	**$289,600**	**Add Gross Income Figures for One & Two Bedroom Units**
Vacancy & Collection Loss (5%)	$11,820	$12,647	$13,533	**$14,480**	**Multiply each year annual gross income by 5%**
Annual Effective Gross Income	$224,580	$240,301	$257,122	**$275,120**	**Subtract vacancy figure from annual gross income for each year**
Annual Expenses	$50,000	$52,000	$54,080	**$56,243**	**Increase each year expenses 4% by multiplying by 1.04**
Annual Net Income	$174,580	$188,301	$203,042	**$218,877**	**Subtract expenses from effective gross income for each year**

#11 **Use the four net annual income figures for years one, two, three and four.**

	Year One	**Year Two**	**Year Three**	**Year Four**	
	$174,580	$188,301	$203,042	$218,877	
Add Property Sale Price To Year 4				**$1,500,000**	**4th year annual net income of $218,877 +**
	$174,580	$188,301	$203,042	$1,718,877	**$1,500,000 proceeds of sale = $1,718,877**

Output = NPV ("net present value")

$1,640,894 Rate = 10%

#12 **Note: Before the clock starts (time 0), you buy the property for $1,750,000. Input the purchase price as a negative number, $ going out of your pocket. Use the same figures as used in #11 and put a year zero in front with the purchase price input as a negative.**

Year Zero	**Year One**	**Year Two**	**Year Three**	**Year Four**	
-$1,750,000	$174,580	$188,301	$203,042	$1,718,877	**BE SURE TO ROUND % ANSWER TO NEAREST TENTH**

Output = IRR ("intenral rate of return")

NO input required for "Guess" in function box.

8.0%

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#BONUS **One Bedroom Unit Monthly Rent =** $900 **X 11 units X 12 months (1st Year Income For One Bedroom Units)**

Two Bedroom Unit Monthly Rent = $1,400 **X 7 units X 12 months (1st Year Income For Two Bedroom Units)**

	Year 1	Year 2	Year 3	Year 4	
Annual Gross Income					
One Bedroom Units	$118,800	$127,116	$136,014	**$145,535**	**Increase each year gross income 7% by multiplying by 1.07**
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Use the four net annual income figures for years one, two, three and four.

	Year One	Year Two	Year Three	Year Four
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Add Property Sale Price To Year 4				**$1,500,000**
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NET PRESENT VALUE = **$1,640,894**

Determine the property values ("outcome values") for each of the six possible combinations of rent. Output = NPV ("net present value") Rate = 9%
Calculations use Net Present Value function (see #11 above). Find the probability of each outcome using the multiplication rule.

Outcome Value Assuming:			**P (X,Y)**		**PRODUCT OF PROBABILITY * OUTCOME**
One Bedroom = $750 & Two Bedroom = $1,250	**$1,533,463**	*	**8%**	=	**$122,677**
One Bedroom = $900 & Two Bedroom = $1,250	**$1,599,115**	*	**20%**	=	**$319,823**
One Bedroom = $1,000 & Two Bedroom = $1,250	**$1,642,883**	*	**12%**	=	**$197,146**
One Bedroom = $750 & Two Bedroom = $1,400	**$1,575,241**	*	**12%**	=	**$189,029**
One Bedroom = $900 & Two Bedroom = $1,400	**$1,640,894**	*	**30%**	=	**$492,268**
One Bedroom = $1,000 & Two Bedroom = $1,400	**$1,684,662**	*	**18%**	=	**$303,239**

ADD UP THE PRODUCTS TO FIND THE "EXPECTED VALUE FOR THIS PROPERY" **$1,624,182**

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