

Financial Functions Fall Final Practice Test #C Annotated Answers

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

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

#1 Output = PMT ". . . must be saved each year . . ." **NOTICE: EACH YEAR = PMT**
(\$10,901)
Inputs: FV = \$1,250,000 ("savings goal"); n = 30 (55 - 25); PV = \$9,000 ("one credit card debt of");
rate = 8.5%. **NOTICE: "Debt" input as positive \$9,000.**

#2A BOTH Output = PV "Present Value of Option One"
OPTION ONE Inputs: PMT = \$50,000 ("per year"); n = 10; rate = 6.5% **NOTICE: PER year = PMT**
(\$359,442)

#2B OPTION TWO Inputs: FV = \$670,000 "lump sum in 12 years"; n = 12; rate = 6.5%
(\$314,688)

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

#3 Output = PV "how much should an investor pay" **NOTE: INVESTMENT VALUES = PV**
(\$43,384)
Inputs: FV = \$60,000 (face value); PMT = \$2,300 per year; rate = 7%; n = 14 years.

#4 Output = FV "how much will have been saved at retirement" **NOTICE: PER year = PMT**
(\$665,476)
Inputs: n = 40 (70-30); PMT = \$4,300 ("per year"); rate = 6% PV = 0 ("no savings or debt")

#5 Output = PMT "monthly payment" **REMEMBER: FOR ALL LOANS, DO MONTHLY**
(\$2,559)
Inputs: PV = \$470,000 (loan amount); rate = 4.3%/12; n = 25*12

#6 Output = PV "how much should an investor pay" **NOTE: INVESTMENT VALUES = PV**
(\$8,621)
Inputs: FV = \$20,000 (face value); rate = 5.4%; n = 16 years

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

(\$1,897,384)

Inputs: PMT = \$4,500 ("per year"); PV = \$12,000 ("current savings"); rate = 9%; n = 40 (65 - 25)

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

NOTICE: EACH YEAR = PMT

(\$4,060)

Inputs: FV = \$1,000,000 ("savings goal"); rate = 6.5%; n = 45 (65-20)

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

(\$369,466)

Inputs: PMT = \$129,000 per year * 27% / 12;
rate = 4.9%/12; n = 15*12

**NOTE: *27% allocates annual income to annual payment
Dividing by 12 converts annual payment to monthly payment**

#10 **One Bedroom Unit Monthly Rent = \$800 X 8 units X 12 months (1st Year Income For One Bedroom Units)**
Two Bedroom Unit Monthly Rent = \$2,000 X 6 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	\$76,800	\$82,944	\$89,580	\$96,746	Increase each year gross income 8% by multiplying by 1.08
Two Bedroom Units	\$144,000	\$155,520	\$167,962	\$181,399	Increase each year gross income 8% by multiplying by 1.08
Total Annual Gross Income	\$220,800	\$238,464	\$257,541	\$278,144	Add Gross Income Figures for One & Two Bedroom Units
Vacancy & Collection Loss (6%)	\$13,248	\$14,308	\$15,452	\$16,689	Multiply each year annual gross income by 6%
Annual Effective Gross Income	\$207,552	\$224,156	\$242,089	\$261,456	Subtract vacancy figure from annual gross income for each year
Annual Expenses	\$75,000	\$78,750	\$82,688	\$86,822	Increase each year expenses 5% by multiplying by 1.05
Annual Net Income	\$132,552	\$145,406	\$159,401	\$174,634	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	
	\$132,552	\$145,406	\$159,401	\$174,634	
Add Property Sale Price To Year 4				\$1,450,000	4th year annual net income of \$792,059 +
	\$132,552	\$145,406	\$159,401	\$1,624,634	\$1,450,000 proceeds of sale = \$2,242,059

Output = NPV ("net present value")

\$1,470,079

Rate = 10%

#12 **Note: Before the clock starts (time 0), you buy the property for \$1,630,000. 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	
	-\$1,630,000	\$132,552	\$145,406	\$159,401	\$1,624,634	BE SURE TO ROUND % ANSWER TO NEAREST TENTH
Output = IRR ("internal rate of return")						NO input required for "Guess" in function box.

6.8%

#BONUS **One Bedroom Unit Monthly Rent =** \$600 **X 8 units X 12 months (1st Year Income For One Bedroom Units)**
Two Bedroom Unit Monthly Rent = \$2,200 **X 6 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	\$57,600	\$62,208	\$67,185	\$72,559	Increase each year gross income 8% by multiplying by 1.08
Two Bedroom Units	\$158,400	\$171,072	\$184,758	\$199,538	Increase each year gross income 8% by multiplying by 1.08
Total Annual Gross Income	\$216,000	\$233,280	\$251,942	\$272,098	Add Gross Income Figures for One & Two Bedroom Units
Vacancy & Collection Loss (6%)	\$12,960	\$13,997	\$15,117	\$16,326	Multiply each year annual gross income by 6%
Annual Effective Gross Income	\$203,040	\$219,283	\$236,826	\$255,772	Subtract vacancy figure from annual gross income for each year
Annual Expenses	\$75,000	\$78,750	\$82,688	\$86,822	Increase each year expenses 5% by multiplying by 1.05
Annual Net Income	\$128,040	\$140,533	\$154,138	\$168,950	Subtract expenses from effective gross income for each year

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

	Year One	Year Two	Year Three	Year Four
	\$128,040	\$140,533	\$154,138	\$168,950
Add Property Sale Price To Year 4				\$1,450,000
	\$128,040	\$140,533	\$154,138	\$1,618,950

NET PRESENT VALUE = **\$1,454,114**

Determine the property values ("outcome values") for each of the six possible combinations of rent. Output = NPV ("net present value") Rate = 10%
 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 = \$600 & Two Bedroom = \$2,000	\$1,406,219	*	3.0%	=	\$42,187
One Bedroom = \$800 & Two Bedroom = \$2,000	\$1,470,079	*	12.0%	=	\$176,409
One Bedroom = \$1,000 & Two Bedroom = \$2,000	\$1,533,940	*	15.0%	=	\$230,091
One Bedroom = \$600 & Two Bedroom = \$2,200	\$1,454,114	*	7.0%	=	\$101,788
One Bedroom = \$800 & Two Bedroom = \$2,200	\$1,517,975	*	28.0%	=	\$425,033
One Bedroom = \$1,000 & Two Bedroom = \$2,200	\$1,581,836	*	35.0%	=	\$553,643

ADD UP THE PRODUCTS TO FIND THE "EXPECTED VALUE FOR THIS PROPERTY" **\$1,529,151**

100.0%