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 | (\$5,743,556) | Output = FV"how much will have been saved at retirement"NOTICE: PER year = PMT(\$5,743,556)Wow, that's a lot of \$ for just saving \$5,000 per year. It pays to start early!!!!Inputs:n = 60 (80-20); PMT = \$5,000 ("per year"); rate = 7.8% PV = 0 ("no savings or debt") | | | | | | | |
|-----|---------------------------|---|--|---|---------------------------------------|--|--|--|--|
| #2A | вотн | Output = PV "Present Value of Option One" | | | | | | | |
| | OPTION ONE (\$228,627) | Inputs: PMT = \$35,000 ("per year"); n = 10; rate = 8.6% NOTICE: PER year = PMT | | | | | | | |
| | | | | | | | | | |
| #2B | OPTION TWO (\$167,207) | Inputs: FV) | ' = \$450,000 "lump sum in 12 years"; n =1 | 2; rate = 8.6% | | | | | |
| | | | | | | | | | |
| #2C | OPTION ONE HAS | A HIGHER P | PRESENT VALUE & IS THE BEST OPTION. | | | | | | |
| | | | | | | | | | |
| #3 | (\$3,814) | Output = F) Inputs: | PMT "monthly payment" PV = \$780,000 (loan amount); rate = 4.29 | REMEMBER: FOR ALL LOANS %/12; n = 30*12 | S, DO MONTHLY | | | | |
| | | | | | | | | | |
| #4 | (\$6,006) | Output = F | PMT "must be saved each year" | NOTICE: EACH YEAR = PMT | | | | | |
| | | Inputs: $FV = \$1,000,000$ ("savings goal"); $n = 40 (70 - 30)$; $PV = -\$15,000$ ("presently h | | | ave savings of"); | | | | |
| | | | rate = 5./%. | NOTICE: | "Savings" input as negative \$15,000. | | | | |
| | | | | | | | | | |
| #5 | (\$35,720) | Output = PV "how much should an investor pay" NC | | NOTE: II | DTE: INVESTMENT VALUES = PV | | | | |
| | | inputs: | Fv = \$40,000 (face value); PMT = \$2,700 | per year; rate = 8%; n = 15 years. | | | | | |
| #6 | | Output = F | PV "how much should an investor pay" | NOTE: II | NVESTMENT VALUES = PV | | | | |
| | (\$24,879) | Inputs: FV = \$60,000 (face value); rate = 4.5%; n = 20 years | | = 20 years | | | | | |

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| #7 | Output = | = PV "how much can you borr | ow", loan amoun | nt | | | | | |
|---|--------------------------------|---|---|---------------------------------------|--|--|--|--|--|
| | (\$522,919) Inputs: | PMT = \$185,000 per year * rate = 5.1%/12; n = 15*12 | 27% / 12; | | NOTE: 27% allocates annual income to annual payment Dividing by 12 converts annual payment to monthly payment | | | | |
| | | | | | | | | | |
| #8 | Output = | = PMT ("must be saved each y | 1T ("must be saved each year") | | | NOTICE: EACH YEAR = PMT | | | |
| | (\$ 5,435) | EV - \$1,300,000 ("savings (| 10.21"): rate - 6.4º | %·n - 15 (72_2 | 7) | | | | |
| | inputs. | 1 V – 91,300,000 (30Vings g | 50di), idte = 0.47 | , , , , , , , , , , , , , , , , , , , | <i>'</i>] | | | | |
| #9 | Output = (\$873,036) | retirement" | ement" Note: Student loan is a liability, input as negative value | | | | | | |
| | Inputs: | PMT = \$8,000 ("per year"); |); rate = 5.7%; | n = 40 (70 - 30) | | | | | |
| | | | | | | | | | |
| #10One Bedroom Unit Monthly Rent =\$1,000X 8 units X 12 months (1st Year Income For One Bedroom Units)Two Bedroom Unit Monthly Rent =\$1,650X 9 units X 12 months (1st Year Income For Two Bedroom Units) | | | | | For One Bedroom Units) For Two Bedroom Units) | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | | | | |
| | Annual Gross Income | | | | | | | | |
| | One Bedroom Units | \$96,000 | D \$103,680 | \$111,974 | \$120,932 | Increase each year gross income 7% by multiplying by 1.07 | | | |
| | Two Bedroom Units | \$178,200 |) \$192,456 | \$207,852 | \$224,481 | Increase each year gross income 7% by multiplying by 1.07 | | | |
| | Total Annual Gross Incon | ne \$274,200 |) \$296,136 | \$319,827 | \$345,413 | Add Gross Income Figures for One & Two Bedroom Units | | | |
| | Vacancy & Collection Loss (4 | 4%) \$10,968 | 8 \$11,845 | \$12,793 | \$13,817 | Multiply each year annual gross income by 5% | | | |
| | Annual Effective Gross Inco | me \$263,232 | 2 \$284,291 | \$307,034 | \$331,597 | Subtract vacancy figure from annual gross income for each year | | | |
| | Annual Expenses | \$45,000 |) \$46,350 | \$47,741 | \$49,173 | Increase each year expenses 4% by multiplying by 1.04 | | | |
| | Annual Net Income | \$218,232 | 2 \$237,941 | \$259,293 | \$282,424 | Subtract expenses from effective gross income for each year | | | |
| | | | | | | | | | |
| #11 | Use the four net annual inco | ome figures for years one, tw | o, three and four | | | | | | |
| | | Year One | Year Two | Year Three | Year Four | | | | |
| | | \$218,232 | 2 \$237,941 | \$259,293 | \$282,424 | | | | |
| | Add Property Sale Price To | Year 4 | | | \$1,250,000 | 4th year annual net income of \$282,424 + | | | |
| | | \$218,232 | 2 \$237,941 | \$259,293 | \$1,532,424 | \$1,250,000 proceeds of sale = \$1,532,424 | | | |
| | Output = NPV ("net present | value") | | | | | | | |
| | \$1,542,978 | Rate = 12% | | | | | | | |
| ⊭1 2 | Note: Before the clock start | ts (time 0) you buy the proper | rty for \$1 600 00 | 0 Input the p | Irchase price | as a negative number \$ going out | | | |
| 112 | of your pocket. Use the sa | me figures as used in #11 and | put a year zero i | in front with t | he purchase p | rice input as a negative. | | | |
| | | Year Zero Year One | Year Two | Year Three | Year Four | | | | |
| | | -\$1,600,000 \$218,232 | 2 \$237,941 | \$259,293 | \$1,532,424 | BE SURE TO ROUND % ANSWER TO NEAREST TENTH | | | |
| | Output = | = IRR ("intenral rate of return" |) | | | NO input required for "Guess" in function box. | | | |
| | 10.8% | | | | | | | | |
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#BONUS One Bedroom Unit Monthly Rent = Two Bedroom Unit Monthly Rent =

\$650 X 8 units X 12 months (1st Year Income For One Bedroom Units)

\$1,500 X 9 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 | \$62 <i>,</i> 400 | \$67,392 | \$72,783 | \$78,606 | Increase each year gross income 8.5% by multiplying by 1.085 |
| Two Bedroom Units | \$162,000 | \$174,960 | \$188,957 | \$204,073 | Increase each year gross income 8.5% by multiplying by 1.085 |
| Total Annual Gross Income | \$224,400 | \$242,352 | \$261,740 | \$282,679 | Add Gross Income Figures for One & Two Bedroom Units |
| Vacancy & Collection Loss (4%) | \$8,976 | \$9,694 | \$10,470 | \$11, 307 | Multiply each year annual gross income by 4% |
| Annual Effective Gross Income | \$215,424 | \$232,658 | \$251,271 | \$271,372 | Subtract vacancy figure from annual gross income for each year |
| Annual Expenses | \$45,000 | \$46,350 | \$47,741 | \$49,173 | Increase each year expenses 3.5% by multiplying by 1.035 |
| Annual Net Income | \$170,424 | \$186,308 | \$203,530 | \$222,199 | 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 |
|-----------------------------------|-----------|-----------|------------|-------------|
| | \$170,424 | \$186,308 | \$203,530 | \$222,199 |
| Add Property Sale Price To Year 4 | | | | \$1,250,000 |
| | \$170,424 | \$186,308 | \$203,530 | \$1,472,199 |

NET PRESENT VALUE = \$1,381,166

Determine the property values ("outcome values") for each of the six possible combinations of rent. Output = NPV ("net present value") Rate = 12% 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 = \$650 & Two Bedroom = \$1,500 | \$1,381,166 | * | 7.5% | = | \$103,587 |
| One Bedroom = \$1,000 & Two Bedroom = \$1,500 | \$1,490,340 | * | 12.0% | = | \$178,841 |
| One Bedroom = \$1,350 & Two Bedroom = \$1,500 | \$1,599,514 | * | 10.5% | = | \$167,949 |
| One Bedroom = \$650 & Two Bedroom = \$1,650 | \$1,433,803 | * | 17.5% | = | \$250,916 |
| One Bedroom = \$1,000 & Two Bedroom = \$1,650 | \$1,542,978 | * | 28.0% | = | \$432,034 |
| One Bedroom = \$1,350 & Two Bedroom = \$1,650 | \$1,652,152 | * | 24.5% | = | \$404,777 |
| | | | | + | |

ADD UP THE PRODUCTS TO FIND THE "EXPECTED VALUE FOR THIS PROPERY"

\$1,538,104

100.0%