

Advanced Math Finance Exam Review KEY

1. Erica makes \$18.50 an hour working 40 hours a week.

<p>a. Calculate her annual gross income if there are 52 weeks in a year. Annual Gross Income= \$18.50(40)(52)= \$38480.00</p>	<p>b. Calculate her gross monthly income. Gross monthly income= Annual Gross Income/12 Gross monthly income=\$38480.00 / 12= \$3206.67</p>
<p>c. If 6.2% is deducted for FICA, 1.45% is deducted for Medicare, and 8% is deducted for Federal Income Tax, calculate her net monthly income. Net Monthly %=100-6.2-1.45-8 = 84.35% Net Monthly Income= (Net Monthly %)Gross Monthly Income Net Monthly Income= (0.8435)\$3206.67 = \$2704.83</p>	<p>d. If 3% of her net monthly income is deducted for retirement, calculate her take home pay. Take Home Pay= Net Monthly - Retirement Retirement= 0.03(\$2704.83)= \$81.14 Take Home Pay= \$2704.83-\$81.14 Take Home Pay= \$2623.69</p>

2. For the function $FV = 2500(1.075)^x$, give the following information.

<p>a. The initial investment (present value) The initial investment is \$2500</p>	<p>b. The interest rate The interest rate is 7.5% since 1.075-1=0.075 as a percent 7.5%</p>	<p>c. The Future Value after 12 years. $FV = 2500(1.075)^{12} = \\5954.45</p>
---	---	---

3. Given the following table of an investment, answer the following questions.

<table border="1"> <thead> <tr> <th>Years</th> <th>Money Earned</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>400</td> </tr> <tr> <td>1</td> <td>420</td> </tr> <tr> <td>2</td> <td>441</td> </tr> <tr> <td>3</td> <td>463.05</td> </tr> </tbody> </table>	Years	Money Earned	0	400	1	420	2	441	3	463.05	<p>a. Give the regression equation for the given table $y=400(1.05)^x$</p>	<p>b. What is the interest rate? The interest rate is 5%</p>	<p>c. How much will this investment be worth in 30 years? In 30 years the invest will be worth \$1728.78 using $400(1.050)^{30}$</p>
Years	Money Earned												
0	400												
1	420												
2	441												
3	463.05												

For EX 4-8, Use the given information and the TVM solver to complete the given tables and answer the question in a complete sentence.

<p>4. Tanner invested \$5000 into a CD that has an interest rate of 4.7% compounded quarterly. How much will he have when he wants to retire in 30 years? Answer Statement:</p> <p>In 30 years Tanner will have \$20312.13</p>	<table border="1"> <tbody> <tr><td>N</td><td>4(30)=120</td></tr> <tr><td>I%</td><td>4.7</td></tr> <tr><td>PV</td><td>-5000</td></tr> <tr><td>PMT</td><td>0</td></tr> <tr><td>FV</td><td>solve</td></tr> <tr><td>P/Y</td><td>4</td></tr> <tr><td>C/Y</td><td>4</td></tr> </tbody> </table>	N	4(30)=120	I%	4.7	PV	-5000	PMT	0	FV	solve	P/Y	4	C/Y	4	<p>5. Marco wants to have \$2,000,000 in 45 years. If he found a great investment at a rate of 4.3% compounded monthly, how much will he have to initially invest? Answer Statement:</p> <p>Marco will have to invest \$289849.28 to have \$2,000,000 in 45 years</p>	<table border="1"> <tbody> <tr><td>N</td><td>12*45=540</td></tr> <tr><td>I%</td><td>4.3</td></tr> <tr><td>PV</td><td>Solve</td></tr> <tr><td>PMT</td><td>0</td></tr> <tr><td>FV</td><td>2000000</td></tr> <tr><td>P/Y</td><td>12</td></tr> <tr><td>C/Y</td><td>12</td></tr> </tbody> </table>	N	12*45=540	I%	4.3	PV	Solve	PMT	0	FV	2000000	P/Y	12	C/Y	12
N	4(30)=120																														
I%	4.7																														
PV	-5000																														
PMT	0																														
FV	solve																														
P/Y	4																														
C/Y	4																														
N	12*45=540																														
I%	4.3																														
PV	Solve																														
PMT	0																														
FV	2000000																														
P/Y	12																														
C/Y	12																														
<p>6. John wants to take a dream vacation that will cost him \$7500. He only has \$800, so he invests it at a rate of 4.25% compounded annually. How many years will it take for him have \$7500 to go on his dream vacation, if he doesn't add anything in each month? Answer Statement:</p> <p>It will take John 53.77 years to have the \$7500 needed for the Vacation</p>	<table border="1"> <tbody> <tr><td>N</td><td>Solve</td></tr> <tr><td>I%</td><td>4.25</td></tr> <tr><td>PV</td><td>-800</td></tr> <tr><td>PMT</td><td>0</td></tr> <tr><td>FV</td><td>7500</td></tr> <tr><td>P/Y</td><td>1</td></tr> <tr><td>C/Y</td><td>1</td></tr> </tbody> </table>	N	Solve	I%	4.25	PV	-800	PMT	0	FV	7500	P/Y	1	C/Y	1	<p>7. Sara knows that her dream vacation will cost her \$5000, which she wants to take in 6 years (when she graduates from school). She finds a short-term investment that will allow her to initially deposit \$200 and has an annual interest rate of 1.7% compounded monthly. If she can initially invest \$200, what will her monthly payments have to be to go on her vacation in time? Answer Statement:</p> <p>Sara will have to make monthly payments of \$63.09</p>	<table border="1"> <tbody> <tr><td>N</td><td>6(12)=72</td></tr> <tr><td>I%</td><td>1.7</td></tr> <tr><td>PV</td><td>-200</td></tr> <tr><td>PMT</td><td>solve</td></tr> <tr><td>FV</td><td>5000</td></tr> <tr><td>P/Y</td><td>12</td></tr> <tr><td>C/Y</td><td>12</td></tr> </tbody> </table>	N	6(12)=72	I%	1.7	PV	-200	PMT	solve	FV	5000	P/Y	12	C/Y	12
N	Solve																														
I%	4.25																														
PV	-800																														
PMT	0																														
FV	7500																														
P/Y	1																														
C/Y	1																														
N	6(12)=72																														
I%	1.7																														
PV	-200																														
PMT	solve																														
FV	5000																														
P/Y	12																														
C/Y	12																														

<p>8. Mario wants to buy a used car that is \$15,500. He can put 5% down.</p> <p>a. Calculate his down payment. \$15500 (0.05)=\$775</p> <p>b. How much will Mario be financing for this vehicle? \$15500- 775= \$14725</p>	<p>He has found two different financing options:</p> <p>1. He can finance the car for 4 years at a rate of 4.2%</p> <p>2. He can finance the car for 3 years at a rate of 4.1%.</p> <p>c. Use the two given tables to calculate his monthly payment for each option. Which option should he choose? Justify your answer.</p>	<p>OPTION 1</p> <table border="1" data-bbox="821 134 1073 499"> <tr><td>N</td><td>4 (12)=48</td></tr> <tr><td>I%</td><td>4.2</td></tr> <tr><td>PV</td><td>14725</td></tr> <tr><td>PMT</td><td>Solve</td></tr> <tr><td>FV</td><td>0</td></tr> <tr><td>P/Y</td><td>12</td></tr> <tr><td>C/Y</td><td>12</td></tr> </table> <p>Mario .</p>	N	4 (12)=48	I%	4.2	PV	14725	PMT	Solve	FV	0	P/Y	12	C/Y	12	<p>OPTION 2</p> <table border="1" data-bbox="1180 134 1432 499"> <tr><td>N</td><td>3 (12)=36</td></tr> <tr><td>I%</td><td>4.1</td></tr> <tr><td>PV</td><td>14725</td></tr> <tr><td>PMT</td><td>Solve</td></tr> <tr><td>FV</td><td>0</td></tr> <tr><td>P/Y</td><td>12</td></tr> <tr><td>C/Y</td><td>12</td></tr> </table>	N	3 (12)=36	I%	4.1	PV	14725	PMT	Solve	FV	0	P/Y	12	C/Y	12
N	4 (12)=48																														
I%	4.2																														
PV	14725																														
PMT	Solve																														
FV	0																														
P/Y	12																														
C/Y	12																														
N	3 (12)=36																														
I%	4.1																														
PV	14725																														
PMT	Solve																														
FV	0																														
P/Y	12																														
C/Y	12																														
<p>9. Jenna knows she can retire when she has \$1,000,000. Which investment scenario will allow her to achieve this investment goal in the shortest amount of time?</p> <p>Option 1: She invests a one lump sum of \$50,000 at 6% compounded annually.</p> <p>Option 2: She makes \$400 payments each month at an investment rate of 5% compounded monthly until she reaches her investment goal. Complete the tables at right.</p>	<p>OPTION 1</p> <table border="1" data-bbox="456 737 708 1102"> <tr><td>N</td><td>Solve</td></tr> <tr><td>I%</td><td>6</td></tr> <tr><td>PV</td><td>-50000</td></tr> <tr><td>PMT</td><td>0</td></tr> <tr><td>FV</td><td>1000000</td></tr> <tr><td>P/Y</td><td>1</td></tr> <tr><td>C/Y</td><td>1</td></tr> </table>	N	Solve	I%	6	PV	-50000	PMT	0	FV	1000000	P/Y	1	C/Y	1	<p>OPTION 2</p> <table border="1" data-bbox="821 737 1073 1102"> <tr><td>N</td><td>Solve</td></tr> <tr><td>I%</td><td>6</td></tr> <tr><td>PV</td><td>-50000</td></tr> <tr><td>PMT</td><td>0</td></tr> <tr><td>FV</td><td>1000000</td></tr> <tr><td>P/Y</td><td>1</td></tr> <tr><td>C/Y</td><td>1</td></tr> </table>	N	Solve	I%	6	PV	-50000	PMT	0	FV	1000000	P/Y	1	C/Y	1	<p>Which scenario should she choose? Justify your answer.</p> <p>Jenna should go with option 2 because she would retire in 48.8 years versus 51.4 years.</p>
N	Solve																														
I%	6																														
PV	-50000																														
PMT	0																														
FV	1000000																														
P/Y	1																														
C/Y	1																														
N	Solve																														
I%	6																														
PV	-50000																														
PMT	0																														
FV	1000000																														
P/Y	1																														
C/Y	1																														

<p>10. The Nichols are buying a house selling for \$245,000. They pay a down payment of \$45,000 from the sale of their current house</p> <p>Option 1: Get a 20 year loan at 5.25 %</p> <p>Option 2: Obtain a 15-year mortgage at 4.5 % by paying 1.5 points at the time of closing. .</p>	<p>OPTION 1</p> <table border="1" data-bbox="456 134 708 497"> <tr><td>N</td><td>20(12)=240</td></tr> <tr><td>I%</td><td>5.25</td></tr> <tr><td>PV</td><td>200000</td></tr> <tr><td>PMT</td><td>Solve</td></tr> <tr><td>FV</td><td>0</td></tr> <tr><td>P/Y</td><td>12</td></tr> <tr><td>C/Y</td><td>12</td></tr> </table>	N	20(12)=240	I%	5.25	PV	200000	PMT	Solve	FV	0	P/Y	12	C/Y	12	<p>OPTION 2</p> <table border="1" data-bbox="821 134 1073 497"> <tr><td>N</td><td>15(12)=180</td></tr> <tr><td>I%</td><td>4.5</td></tr> <tr><td>PV</td><td>200000</td></tr> <tr><td>PMT</td><td>Solve</td></tr> <tr><td>FV</td><td>0</td></tr> <tr><td>P/Y</td><td>12</td></tr> <tr><td>C/Y</td><td>12</td></tr> </table>	N	15(12)=180	I%	4.5	PV	200000	PMT	Solve	FV	0	P/Y	12	C/Y	12	<p>Which option will allow them to have the lowest mortgage payment? Option 1 has a mortgage payment of \$1347.69 which is less than the #1529.99 payment for option 2.</p> <p>Which option will allow them to have the lowest Total payment? Total payment=(payment # of payments)+ down +points</p> <p>Option 1: $\\$1347.69(240)+\\$45000=\\$368445.60$</p> <p>Option 2: 1.5 points = $0.015(\\$200000)=\\3000 $\\$1529.99(180)+\\$45000+\\$3000$ $=\\$323398.20$</p> <p>Option 2 has the lowest total payment</p>
N	20(12)=240																														
I%	5.25																														
PV	200000																														
PMT	Solve																														
FV	0																														
P/Y	12																														
C/Y	12																														
N	15(12)=180																														
I%	4.5																														
PV	200000																														
PMT	Solve																														
FV	0																														
P/Y	12																														
C/Y	12																														
<p>11. Completion</p> <p>A. Mortgage B. Points C. Conventional Loan D. Equity E. Variable Rate Mortgage F. .Down payment</p>	<p>The Davis Family is getting ready to buy a new home. They know they will have to get a long term loan, mortgage_to pay for the house. They can choose to go with a loan that has a fixed rate for the duration of the loan conventional loan or a loan that in which the interest rate will change over the life of the loan Variable Rate Mortgage. If they make a 20% down payment then the will immediately have 20% __ Equity in the house. They have checked their credit and along with the 20 % Down payment (the money needed to get a mortgage) they can qualify for a 3.5% interest rate on a 30 year loan. They also realize they can pay 2 points (2 percent of the mortgage) to obtain a 2.5% rate.</p>																														