Sample Waiver Exam for FIN 520

Part I: Mathematics of Finance

Holding period return, apr, ear:

1. Suppose that you buy a stock for $52 you sell the stock two weeks later for $53:
   a. What was your holding period return?
   b. What was your ear (effective annual return) on the investment?

2. Now suppose that you buy a stock for $41, and 86 days later you sell it for $39.50. During the holding period the stock paid a dividend of .42.
   a. What was your holding period return?
   b. What was the ear on the investment?

3. What is the ear of an investment that has an APR of 8% compounded:
   a. Quarterly
   b. Monthly
   c. Weekly
   d. Daily

Time Value of Money, annuity, annuity due, perpetuity:

4. Suppose that you put $2,000 into an IRA at the end of each year for 40 years. If the account pays a 6% return. How much will be in the account at the end of the 40 years?

5. Suppose that the 2,000 in problem 4 is paid at the beginning of each year. Now how much will be in the account at the end of 40 years?

6. Suppose that you place $1300 into an account today. Seven years from today the account is worth $1733.87. To the closest .01% what is the annual return on the investment?

7. An investment costs $5420 and promises to pay $250 every year forever. What is the rate of return on the investment?

8. A 30 year mortgage has an APR of 4.75%. The amount of the mortgage (the amount borrowed) is $256,000. The first payment is due exactly one month after closing on the mortgage.

      a.   What is monthly payment on the mortgage?

      b.   How much of the first payment is used to pay down principle?

Stock and Bond Valuation:

9. A Stock just paid a dividend of $1.56. The stock's dividend is expected to grow at a constant rate of 4.2%. If the appropriate discount rate for the stock is 7.3%, then what is the value of the stock?

10. A stock is expected to pay a dividend of $.83 at the end of this year. The stock has a ROE of 14%, and a payout ratio of .4. If the stock is a constant growth in dividend stock. What is the constant growth rate g and what is the price of the stock assuming a discount rate of 10%.

11. A constant growth dividend stock has a discount rate of 8.8% and just paid a dividend of $D_0 =$ $1.47. If the stock sells for $49.93 then what is the constant growth rate implied by the price of the stock?

12. A bond that matures in 14 years has a 7.2% coupon rate (paid semiannual). The par value of the bond is $1000 and the bond sells for $1098. What is the current yield and the yield to maturity of the bond?

Capital Budgeting:

13. A company is considering two investment projects: Both projects have a life of 5 years. The expected cash flows from the projects are:

	Project A	Project B
Initial Outlay	-$50,000	-$10,000
CF1	$17,000	$ 1,000
CF2	$17,000	$ 5,000
CF3	$17,000	$ 8,000
CF4	$17,000	$ 1,000

    a. What are the IRR's and NPV's of the projects (use a discount rate of 12%)
    b. If the projects are mutually exclusive, which projects should be accepted?
    c. If the projects are not mutually exclusive which projects should be accepted?

14. Be able to identify sunk costs and opportunity costs and when and how to incorporate them into the capital budgeting decision.

Part II: Statistics and Data Analysis

15. The following are monthly returns on a stock (five monthly returns):

Month 1	.08
Month 2	.18
Month 3	-.04
Month 4	.05
Month 5	.11

    Calculate the following:

    Mean
    Standard Deviation (using n-1)
    Variance
    Coefficient of Variation

16. Consider a population with a mean of 26 and a standard deviation of 7. A random sample of size 40 is taken from this population. What is the standard error of the mean?

17. From an examination of monthly returns on an asset you determine that the asset's returns are roughly normally distributed and have a mean of .016 and a standard deviation of .05.
    a. What is the probability that the monthly return will be greater than .016?
    b. What is the probability that the monthly return will be greater than 0?
    c. What is the probability that the monthly return will be less than 0?

18. The mean cost for a home in Florida is reported to be $138,000 with a standard deviation equal to $21,500. To test that the mean in Orlando is greater than the state average 31 home sales in the Orlando area are randomly selected and the mean is found to be $144,000.
    a. What are the null and alternative hypotheses?
    b. What is the Z-statistic for the test?
    c. What is the p-statistic for the test?
    d. Does the evidence indicate that the mean home price in Orlando is greater than the mean for the state?

19. A sample of size 43 is selected from a normal distribution having a mean equal to 74 and a standard deviation equal to 9. What is the probability of selecting a sample having a mean exceeding 77?

20. A study was conducted to estimate the mean amount spent on Christmas gifts for a typical family having two children. A sample of size 150 was taken, and the mean amount spent was $225. Assuming a standard deviation equal to $50, find a 95% confidence interval for μ, the mean for all such families.

21. A sample was selected from a normal population with a standard deviation σ = 6.1. The sample values are 114, 120, 108, 118, 119, 123, 117, 124, 115, and 129.
    a. Construct a confidence interval estimate of the population mean with 0.90 level of confidence.
    b. Construct a confidence interval estimate of the population mean with 0.99 level of confidence.

22. To test the null hypothesis that the mean waist size for males under 40 years equals 34 inches versus the hypothesis that the mean differs from 34, the following data were collected: 33, 33, 30, 34, 34, 40, 35, 35, 32, 38, 34, 32, 35, 32, 32, 34, 36, 30.
    a. Calculate the sample mean and sample standard deviation.
    b. Calculate the t^*-value of the test statistic.
    c. Find the p-value.
    d. Test the stated hypothesis at $\alpha = .05$ and write your conclusion.

23. In order to estimate the pulse rate for young males (less than 30 years), the following sample of pulse rates were obtained: 61, 73, 58, 64, 70, 64, 72, 60, 74, 65, 65, 80, 55, 72, 56, 56. Use these data to find a 95% confidence interval for μ, the mean for all such males.

24. Know what Type I and Type II error is.

25. Your examine the stocks of two corporations (A and B) and find that the monthly returns on asset A have a standard deviation of .03 and the monthly returns on asset b have a standard deviation of .04. If the correlation coefficient for the two assets is -.6, what is the covariance of the returns of assets A and B?

26. A middle school basket ball coach believes that height gives players an advantage at the free throw line. He is also aware that taller players tend to be less physically coordinated which is a negative at the free throw line. However, drawing on his experience with middle school boys, he thinks the height advantage is greater than the coordination disadvantage. To test his theory he gave a gym class of 13 boys one hour of instruction and practice in free throws. He then measures their height and has them throw 25 free throws and records their performance.

The results are given in the table below:

Boy	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Height	52	48	56	50	49	58	57	61	55	54	50	49	48	54
performance	2	1	5	4	0	8	7	5	4	2	4	2	4	7

In the above table each boy is assigned a number, their height is measured in inches and their performance is the number of time they were successful out of 25 throws at the free throw line. Using Excel, the coach ran a linear regression where height is the independent variable and performance is the dependent variable. The results of the regression are given on the next page.

a. What is the R-squared and what does it measure.
b. Does height have a positive impact on performance?
c. What does the model predict that the performance of a 53 inch boy would be (round to closest unit)?

SUMMARY OUTPUT

	Regression Statistics
Multiple R	0.669081503
R Square	0.447670057
Adjusted R Square	0.401642562
Standard Error	1.832135223
Observations	14

ANOVA

	df	SS	MS	F	Significance F
Regression	1	32.6479377	32.6479377	9.7261442	0.008876609
Residual	12	40.2806337	3.3567195		
Total	13	72.9285714			

	Coefficients	Standard Error	t Stat	P-value
Intercept	-16.418041	6.542467	-2.509457	0.027435
height	0.384416	0.123263	3.118677	0.008877

Answer Key:

1. 1.92%; 64.09%
2. -2.63%; -10.71%
3. 8.24%; 8.30%; 8.32%; 8.33%
4. $309,523.93
5. $328,095.37
6. 4.20%
7. 4.61%
8. $1335.42; $322.08
9. $52.44
10. g=8.4%; P0=51.88
11. g=5.3%
12. CY = 6.56%; YTM = 6.15%
13. (A) Project A: IRR = 13.54% NPV = 1,634.93   Project B: IRR = 17.17% NPV = 1,208.57
    (B) Project A (highest NPV)
    (C) Both Projects
14. No Answer
15. Mean   .076
    Standard Deviation (using n-1)   .0808
    Variance   .00653
    Coefficient of Variation   1.06327
16. 1.107
17. .5; .6255; .3745
18. (A) H_0: X=$138,000 H_a: X>$138,000
    (B) 1.553
    (C) .063
    (D) Cannot reject the null hypothesis at a 5% level of significance (one sided)
19. .0143
20. 217 to 233
21. (A) 115.52 to 121.88
    (B) 113.72 to 123
22. (A) =33.833, and s = 2.526
    (B) = -0.28
    (C) = -0.28
    (D) Since p-value > , we fail to reject , and conclude that the mean waist size for males under 40 equals 34.
23. 61.3 to 69.3
24. No Answer
25. -.00072
26. (A) .4477 - measures the goodness of fit, or the percentage of variation in the variable performance that is explained by the variable height.
    (B) Yes, the coefficient of Height is positive and significant.
    (C) 4