BAYLOR UNIVERSITY
HANKAMER SCHOOL OF BUSINESS
DEPARTMENT OF FINANCE, INSURANCE & REAL ESTATE

Risk Management
Fall 2019
Midterm Exam #2
Dr. Garven

Name _____

Problem #1

An entrepreneur has initial wealth of $880. Her initial wealth is invested in two factories, each of which is worth $400. Her remaining $80 in initial wealth is invested in cash. Each factory has a 25% chance of being destroyed and a 75% chance of not suffering any damage. Because the factories are located far away from each other, these risks are statistically independent.

Since the entrepreneur has $80 in cash, she can use some or all of this money to purchase actuarially fair insurance policies to cover her risks. Note that the price for an actuarially fair insurance policy equals the expected value of the payoff (indemnity) provided by the insurance policy.

A. (8 points) Given the entrepreneur's cash resources, if she covers 60% of the first factory's potential loss, what is the maximum level of coverage (in terms of proportion of potential loss) that she can purchase against the risk that the second factory will be destroyed?

B. (8 points) Given the entrepreneur's cash resources, what is the maximum level of coverage (in terms of proportion of potential loss) for each factory that will result in the same premium being paid for each policy?

C. (8 points) Suppose the entrepreneur's utility function is $U(W) = \ln W$. Show that the entrepreneur is better off if she insures both factories at the same level of coverage (for a

total premium of $80) than she would be if she implemented the risk management strategy implied in Part A of this problem.

D. (8 points) Explain *why* the expected utility of having the same level of coverage on both factories is higher than the expected utility of having different levels of coverage.

Problem 3 (32 points)

Suppose that you are considering investing in a portfolio consisting of two securities, A and B. You have estimated that these two securities will provide the following set of state-contingent returns ($r_{A,s}$ and $r_{B,s}$), depending on how well or poorly the economy performs (note: p_s represents the probability that state s will occur):

State of Economy	p_s	$r_{A,s}$	$r_{B,s}$
Boom	50%	30%	3%
Bust	50%	0%	9%

A. (8 points) What are the expected returns for securities A and B?

B. (8 points) What are the standard deviations of the returns for securities A and B?

C. (16 points) Suppose that state contingent returns on the risk free asset ($r_{f,s}$) and the market portfolio ($r_{m,s}$) are estimated as follows:

State of Economy	p_s	$r_{f,s}$	$r_{m,s}$
Boom	50%	6%	20%
Bust	50%	6%	5%

Using this information in conjunction with the information in Problem 3 on Securities A and B, calculate the expected returns as indicated by the Capital Asset Pricing Model (CAPM) and assess whether Securities A and B underpriced, overpriced, or correctly priced? (hint: a security is underpriced (overpriced) if its expected return is more than (less than) the expected return as indicated by the CAPM).