Problem Set 6: Sample Problems to Accompany Chapters 11 and 12
Economics 152
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1.
a. You are in period T-1. (In other words, after this period, there is only 1 more period until you retire). The chance of getting caught shirking if you shirk this period is .2. If you get caught shirking, you will be fired at the end of this period. Your job pays 80K/period. Your next best alternative pays 60K/period. It's worth 3K to you to be able to goof off for a period. Calculate your expected gains for shirking and for not shirking. Which do you choose? (Show your work).
b. If a firm always pays you your VMPt at every point in time, are you more inclined to shirk when you're older (more years on the job) than when you're younger? Explain.
c. A beautiful golf course near a place of business abruptly closes down. (It gets turned into a parking lot.) Would you expect this to raise or lower the probability that more senior workers would choose to shirk? Explain. (Assume no one was able to sneak away to play golf during business hours.)

2.
a. Let the possible stock prices (per share) of a firm next period be given by:
98, 99,100, 101, 102, and suppose each of these 5 possibilities occurs with probability .2
The current price of a share is $100. If the cost of an option is its expected value, how much does it cost to buy 5000 options with strike price $101?
b. A manager has the choice of taking action V which will cost him $6000 in effort cost but will raise the distribution of next periods stock price outcomes to 99,100, 101, 102, 103, (each still occurs with probability .2) How many options with exercise price $101 would you have to grant the manager to make him just willing to take action V? What is the cost to the firm of doing this (see part a).
c. Is there a cheaper way to get the manager to take action V? Explain and demonstrate why or why not.
d. Suppose now that (unobservable) action V' yields stock price outcomes 95, 98, 100, 102, 118, each with probability .2. The manager is risk-averse and does not like this high-variance strategy. (He's worried that if the stock price falls to 95 he'll be fired.) The effort cost (and anxiety cost!) associated with V' for the manager is $36,000. But on average, this is the best action for the company. Could one induce the manager to take action V' (rather than taking no action) by offering him options with strike price $102? How many options would be necessary?
e. What would be a cheaper way of inducing the manager to take action V'?