Econ 614 Hanes Problem set on imperfect capital markets and investment.

This is based on problem 10.4 in Romer chapter 10 (5th edition).

Consider the model of section 10.2 with some changes. There is no cost to an investor of verifying output. Thus, the agreement between the investor and the entrepreneur can take the form of a share contract that promises the investor a share *s* of the realized output *X*. But there is another problem to worry about. After the output is realized, it is possible for the entrepreneur to grab some of it and run away, leaving the investor with the rest. The amount the entrepreneur can grab is a fraction *(1-f)* of what output turns out to be (*X*), that is, he can grab (1-*f)X*, leaving the investor with *fX*.

An entrepreneur will grab and run if, after *X* is realized, the amount he would receive under his agreement wirth the investor is less than (1-*f)X*. Potential investors know this. "Thus the entrepreneur can only credibly promise to repay fraction *f* of the project's output." That is, there can be no agreement in which the entrepreneur promises the investor a share $s > f$; in any agreement, it must be true that $s \leq f$.

1) Assume that the expected payoff from a potential project exceeds the return to the safe alternative investment, that is $\gamma > 1 + r$. What is the condition or conditions that determine whether the project will be undertaken? That is, write down an equation or equations ("equation" can mean $\leq or \geq or =$) that give(s) conditions on the parameters that must be satisfied in order for the project to happen.

2) Using your answer to a), make a graph with *W* on the horizontal axis and γ on the vertical axis. For some combinations of *W* and γ, the project will be undertaken. For other combinations of *W* and γ, the project will not be undertaken. On your graph, shade in the area that contains the combinations of *W* and γ under which the project will be undertaken.

3) "Inefficiency" occurs if $\gamma > 1 + r$ but the project is not undertaken. According to your graph, can such inefficiency occur? Under what circumstances doe it occur?

4) Consider a combination of *W* and γ under which the project *will* be undertaken. Then, there is a decrease in the entreprenuer's wealth. Will that cause the project to *not* be undertaken?

5) Consider a combination of *W* and γ under which the project *will* be undertaken. Then, there is a decrease in *f*. Will that cause the project to *not* be undertaken?