ABC Company does subcontracting on government contracts. ABC Company is a small company with limited capital with a utility function described as follows:

U(x) = $-\frac{x}{100}-\frac{x^{2}}{5,000}$ for x < -1,000

U(x) = $\frac{x}{100}-170$ for -1,000 ≤ x ≤ 10,000

U(x) = $\sqrt{x}$ for x > 10,000

Part 1

Suppose ABC Company is considering bidding on a given contract. It will cost $2,000 to prepare the bid. If the bid is lost, the $2,000 cost is also lost. If ABC Company wins the bid, it will make $40,000 and recover the $2,000 bid preparation cost. Suppose ABC Company believes the probability of winning the contract is 0.5 if a bid is submitted. What should it do?

Part 2

What should the probability of winning have to be before ABC Company would submit a bid?