

Challenge Problem 5

Alice and Bob are having a competition to see who can throw a baseball the farthest from the top of a hill which slopes downward uniformly at an angle ϕ . Alice plays softball, and Bob doesn't have a particularly good arm, so he knows that he's probably gonna lose. Fortunately, Bob has taken mechanics, and he realizes that there is an optimal angle θ at which he should throw the ball so that it has the greatest range; what is that optimal angle?