Physics 4A: Assignment 2
Winter 2020

Please do not write your solutions on this question paper. You might like to use a separate piece of paper for each question. Solutions are not considered complete without the logical argument and/or full calculation.

1. A projectile is launched with an initial speed v_i at an angle θ_i such that $\theta_i > 45°$. At the moment when the horizontal and vertical components of the velocity first become equal, what is the radius of curvature of the projectile's trajectory?

2. Starting from rest, a block of mass m slides down a frictionless incline at angle θ ($0° < \theta < 90°$) where it runs into a spring of spring constant k. When the block momentarily stops, it has compressed the spring by distance x. Find expressions for

   (a) the distance the block slides down the incline from when it is released to when it momentarily stops

   (b) the distance between the point of the first block-spring contact and the point where the block's speed is greatest.