**PAKISTAN INSTITUTE OF ENGINEERING AND APPLIED SCIENCES**

DEPARTMENT OF PHYSICS AND APPLIED MATHEMATICS

ASSIGNMENT # 3, PAM–533, DUE DATE: 28/07/2021

As discussed in the class, the expression for finding the range x of a shell fired from a cannon mounted on the tower of a fortress as a function of launch angle $\vartheta$ is given as:

$$x(\vartheta) = \frac{v_0 \cos\vartheta}{g}[v_o \sin\vartheta + \sqrt{(v_0^2 \sin^2\vartheta) + 2y_0 g}]$$

Write down the simplest possible analytical expression for launch angle $\vartheta$ as a function of range x. Show steps.