Vector Nature of Projectile Motion (5 MARKS)

The following assignment must be submitted to your tutor/marker for evaluation. Be sure to show all your work and explain the method of arriving at your answers. Submit this assignment, along with all the other assignments from Modules 3 and 4, after you have completed Module 4.

The physics of a projectile launched at an angle

a) The diagram below shows a projectile launched at some angle up and to the right.
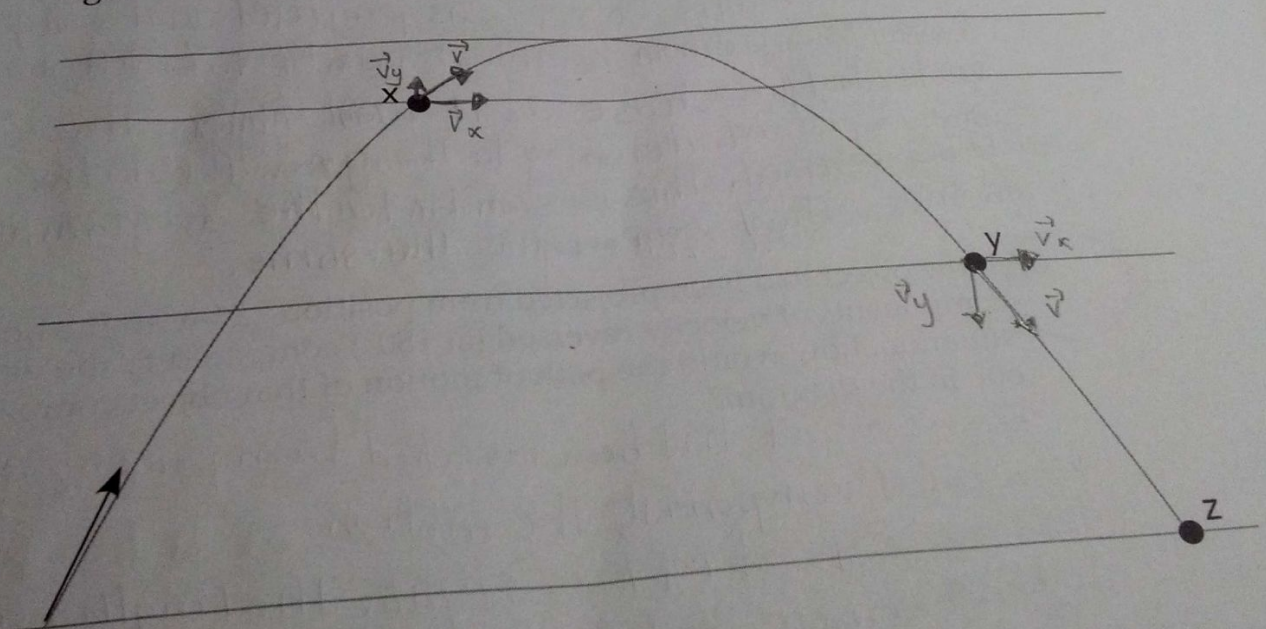
Draw possible horizontal and vertical components of the velocity at point "X."

Draw a possible total velocity vector at point "Y." Be sure to demonstrat how you arrived at the answer.

I added the vertical and horizontal components.

Assignment 3.2: Vector Nature of Projectile Motion (continued)

b) If an object had been projected horizontally with the same magnitude as in the depicted situation, how would the motion compare with that of the object in the diagram?

If an object was projected horizontally, the same distance throughout each time interval ... horizontal component ... change ... the same ...

c) If an object had been projected vertically with the same initial vertical velocity as the object in the diagram, how would its vertical velocity components compare?

If the same object was projected vertically, it would have its maximum height at position I and its magnitude would slowly decrease as it went higher. This would be the same as it was returning to the ground but the direction would be reversed. This is similar to the diagram in question a and the vertical component is the same.

d) If the object had been projected from position "Z" with the horizontal components of velocity reversed (at 180°) compared to the depicted situation, how would the path of motion of that object compare with the one in the diagram?

If the object had been launched from point "Z", with a reverse horizontal component, the motion would be from right to left instead of left to right. The lengths of the components would not change, just their directions. The path of motion would be the exact same as in question a, except the direction would be reversed.

Method of Assessment

... will be determined as follows: