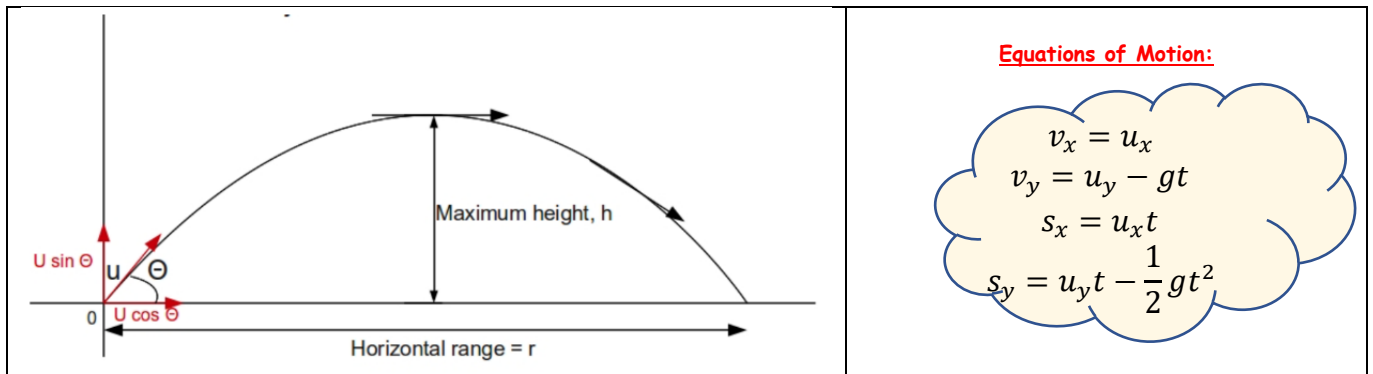


Topic 3: Projectiles

1) Equations of Motion:



2) Important Results:

<p>a) Range/Greatest Height:</p> <div style="border: 1px solid blue; border-radius: 50%; padding: 10px; width: fit-content; margin: 10px auto;"> $\text{Range} = S_x \text{ when } S_y = 0$ </div> <div style="border: 1px solid blue; border-radius: 50%; padding: 10px; width: fit-content; margin: 10px auto;"> $\text{Max Hgt} = S_y \text{ when } V_y = 0$ </div>	<p>b) Target Practice:</p> <p>Steps:</p> <ol style="list-style-type: none"> S_x = horizontal distance to target and get an expression for t. Sub value for t into S_y <p>Two identities needed for most problems:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid blue; border-radius: 50%; padding: 10px;"> $\tan A = \frac{\sin A}{\cos A}$ </div> <div style="border: 1px solid blue; border-radius: 50%; padding: 10px;"> $\frac{1}{\cos^2 A} = 1 + \tan^2 A$ </div> </div>
<p>c) Bouncing Projectiles:</p> <p>Steps:</p> <ol style="list-style-type: none"> Find V_y and V_x when $S_y = 0$. Collision takes place in y direction only usually, so \Rightarrow Velocity after bounce = $V_x \vec{i} - eV_y \vec{j}$ Form new equations of motion for next bounce and restart 	

3) General Tips for Exam Question:

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| <ul style="list-style-type: none"> ○ Do draw diagrams for each part of the question. ○ Do know your Trigonometry well. ○ Do be familiar with and use the Mathematical Tables. ○ Don't mix up the displacement vector with the velocity vector. |
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