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APPLYING THE CYCLOID IN THE OBLIQUE LAUNCH: Another way to demonstrate the escape velocity of planets and the orbital speed of satellites.

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In the Cold War, the space race began, which encouraged the production of technologies that use orbital velocity and escape velocity. Today, these concepts are again needed in the second space race. This work aimed to compare the mathematical derivation of these quantities already established in the literature with another method developed here, which uses the cycloid. The methodology was to use the equations of the vertical and horizontal position of the cycloid and the equations of height and range of oblique launches to obtain the escape and orbital velocity. We then compare these alternative derivations with those already established. We conclude that the demonstrations from the cycloid are better, as it allows us to observe the importance of the launch angle and the angle of the orbit in relation to the body when performing an orbital launch or an orbital escape, we can also observe that the rotation movement of the planet in the its axis is cycloidal.

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