





# Variable Projectile Launcher (VPL)

| Section 1, Group 7 | Michael Dillane, Michael Erdenberger, Alden Kane, Frank Legambi, Tait McGinn

X Position of Object (m)

5

Y Position of Object (m)

2

Z Position of Object (m)

1

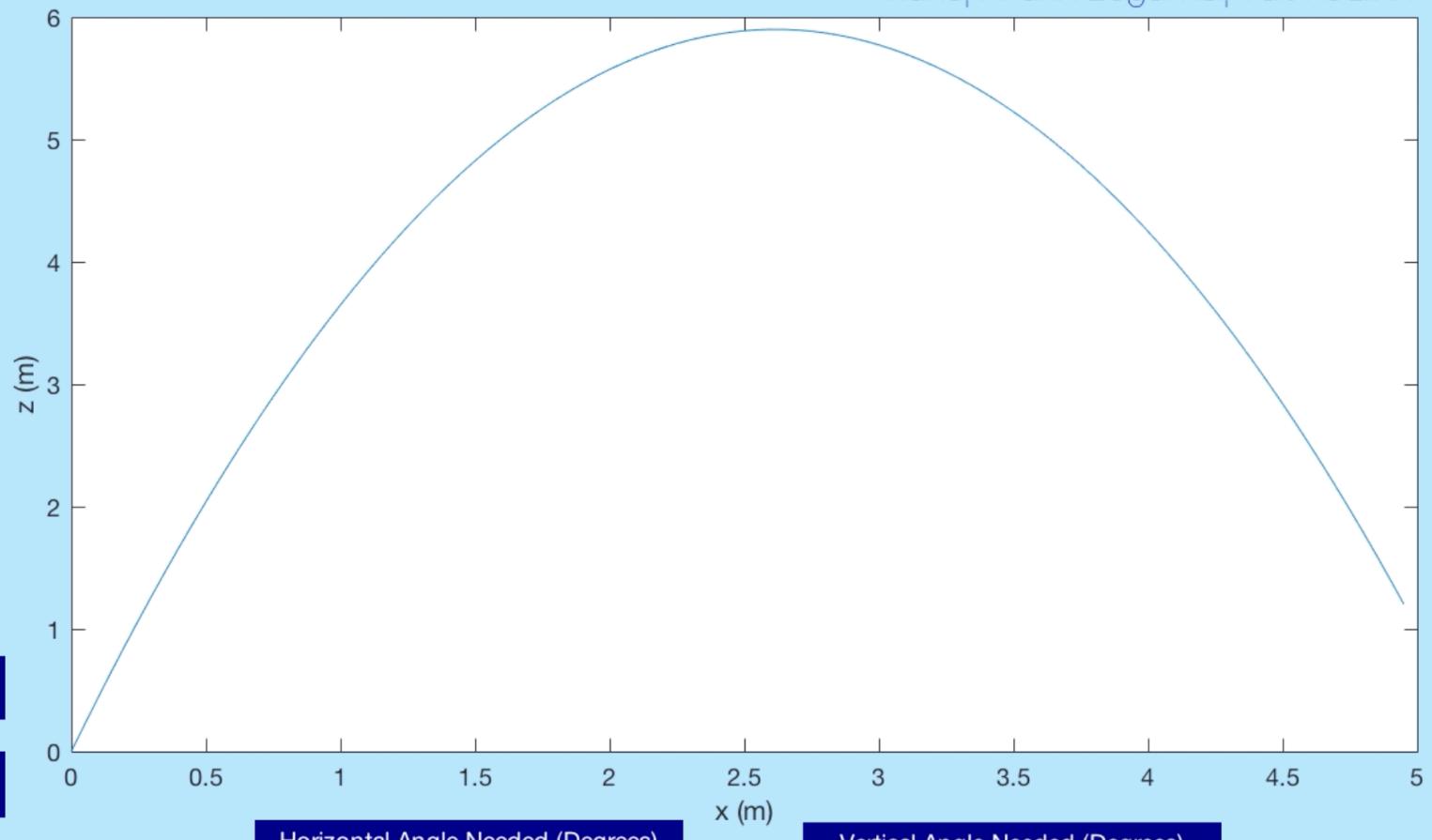
Initial Velocity (m/s)

11.02

Lower Vertical Angle

Higher Vertical Angle

Calculate!



Horizontal Angle Needed (Degrees)

21.8014

Vertical Angle Needed (Degrees)

77.4992

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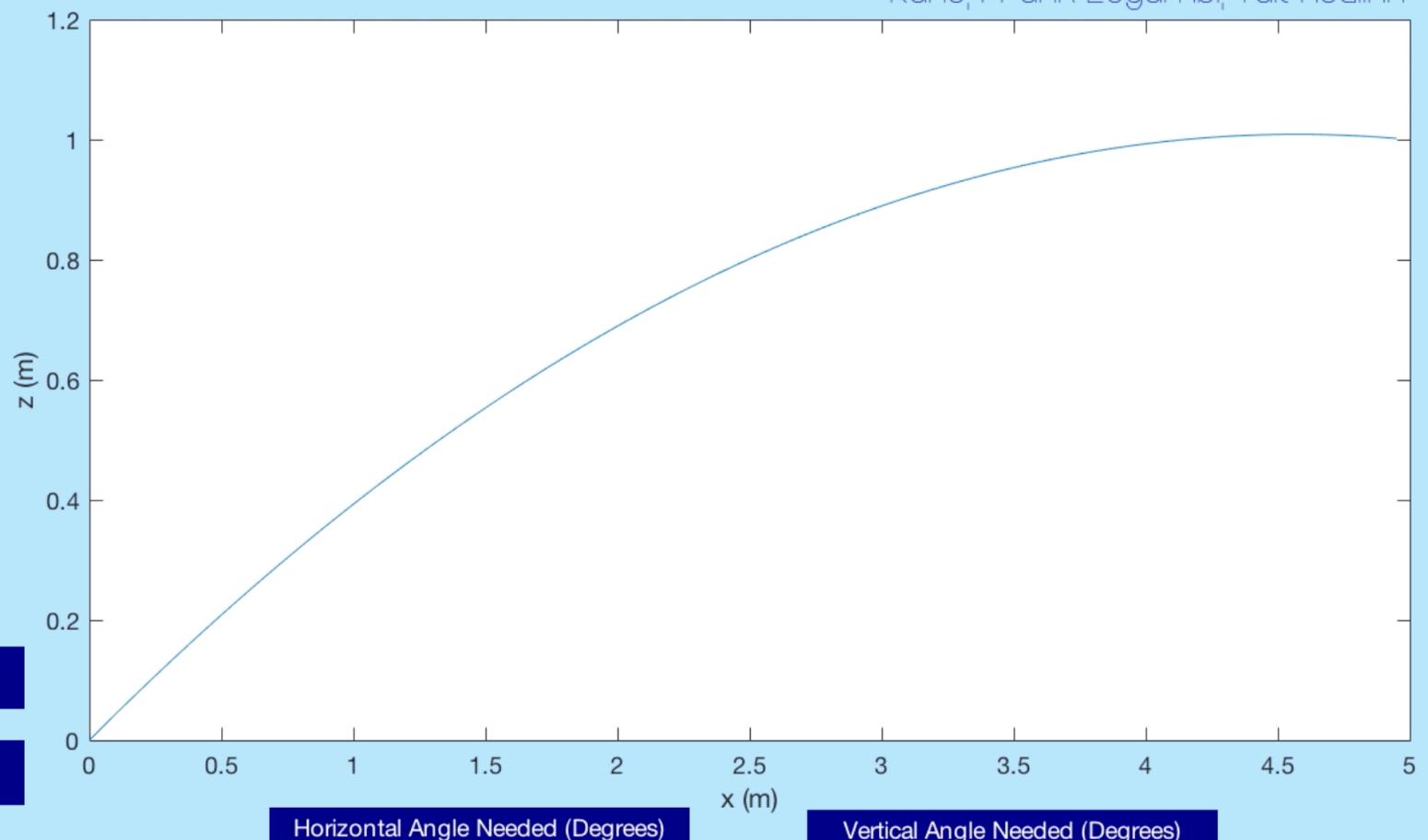
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Lower Vertical Angle

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Calculate!



21.8014

23.8107

# Verification and Predictions

- Using the Range Equation, the initial velocity of the VPL was tested under different scenarios. Five tests were conducted:
- From test shots, we expect the VPL to hit the target about  $\frac{1}{2}$  of the trials due to wind, constraints from the PVC build, and the trigger not being pulled correctly
- When the VPL fires without the arrow yawing, it will match the GUI

Test #	Calculated $V_i$
1	10.82 m/s
2	11.21 m/s
3	11.04 m/s
4	11.11 m/s
5	10.92 m/s
Avg.	11.02 m/s