

Name _____ **Answer Key** _____
Honors Physics
Period _____

Date _____
Kinematics WS #10H
Mrs. Nadworny

Kinematics Challenge Question

Directions: Solve the following problems using the GUESS method. Show all work clearly

1. A rocket is launched with an initial velocity of 22.1 meters per second upward from a platform 15.5 meters high. It lands on the ground below the platform.

a. Determine the flight time of the rocket.

$$d = v_i t + \frac{1}{2} a t^2$$

$$-15.5m = (22.1 \frac{m}{s})t + \frac{1}{2}(-9.81 \frac{m}{s^2})(t^2)$$

Quadratic Equation!

$$4.91t^2 - 22.1t - 15.5 = 0$$

$$t = \frac{-(-22.1) \pm \sqrt{(-22.1)^2 - 4(4.91)(-15.5)}}{2(4.91)}$$

$$t = 5.12s \text{ and } -0.617s$$

b. Determine the maximum height attained by the rocket.

$$d = \frac{-v_i^2}{2a} = \frac{-(22.1 \frac{m}{s})^2}{2(-9.81 \frac{m}{s^2})} = 24.9m$$

$$24.9m + 15.5m = 40.4m$$

Answers in size order: 5.12, 40.4