Name:____ Period:__________ Date:____________

USE THE QUADRATIC EQUATION TO SOLVE THE 3 DROP ROCK TRANSITIONS BELOW - SEE HOW TO SOLVE ANY EQUATION FIRST

TRANSITION A

Changing A requires a different gravity. How long would it take for the Rock to hit the Ground on the Moon where Gravity = 1.6m/s^2 ? Show Solution Reset

$$0 = (-0.8)X^2 + (0)X + 490$$

Ground Y=0 | ($\frac{1}{2}$)Gravity A = -0.8 | Init Velocity B = 0 | Height C = 490

Use Quadratic Equation to solve for X

$$X = \frac{0 \pm \sqrt{(0)^2 - (4)(-0.8)(490)}}{(2)(-0.8)}$$

$$X = \frac{\pm\sqrt{1568}}{-1.6} = \frac{-39.6}{-1.6}$$

$$X = 24.75 \text{ Seconds}$$

TRANSITION B

If we threw the rock rather than just drop the rock, there would be initial velocity and **B** would not equal 0.

How long would it take for the Rock to hit the ground, if we threw it up 20$^{meters}/_{second}$? Show Solution

$$0 = (-4.9)X^2 + (20)X + 490$$

Ground Y=0 | ($\frac{1}{2}$)Gravity A = -4.9 | Init Velocity B = 20 | Height C = 490

Use Quadratic Equation to solve for X

$$X = \frac{-20 \pm \sqrt{(-20)^2 - (4)(-4.9)(490)}}{(2)(-4.9)}$$

$$X = \frac{-20 \pm \sqrt{10004}}{-9.8} = \frac{-20 \pm 100}{-9.8}$$

$$X = \frac{-120}{-9.8} = 12.24 \text{ Seconds}$$

TRANSITION C

What if used a different building that was 700 meters tall, then C would = 700. How long would it take for the Rock to hit the ground? Show Solution

$$0 = (-4.9)X^2 + (0)X + 700$$

Ground Y=0 | ($\frac{1}{2}$)Gravity A = -4.9 | Init Velocity B = 0 | Height C = 700

Use Quadratic Equation to solve for X

$$X = \frac{0 \pm \sqrt{(0)^2 - (4)(-4.9)(700)}}{(2)(-4.9)}$$

$$X = \frac{\pm\sqrt{13720}}{-9.8} = \frac{-117.1}{-9.8}$$

$$X = 11.95 \text{ Seconds}$$