

Projectile Motion

NAME _____

DATE: _____

Example: A cannon is fired with an initial total velocity of 802 m/s at an angle of 28° . How long is the cannon ball in the air? How far (horizontally) did it travel?

1. Two students decide to throw their text books off of the roof of a 160 m tall building. One student drops their book (giving no initial velocity), the other throws the book straight down at a velocity of 10 m/s. How much time goes by after the first book hits the ground until the second one lands?

2. A penny is thrown off the Empire State building at an initial velocity of 15.6 m/s at an angle 45° **below** the horizon. If the Empire State building is 443 m. How long is the penny in the air? How far did it travel?

3. A soccer goalie stands in her goal and kicks the ball at 30 m/s at an angle of 50° . Does the soccer ball reach the opposite goal before hitting the ground? (length of field is 90 m).

4. What if she moves her angle to 45° , and everything else is the same?

5. Taylor Martinez throws a football downfield at 22 m/s at an angle of 10° . How far does the pass travel? How far does it travel if it is thrown on the moon? (replace the -4.9 with -0.8)