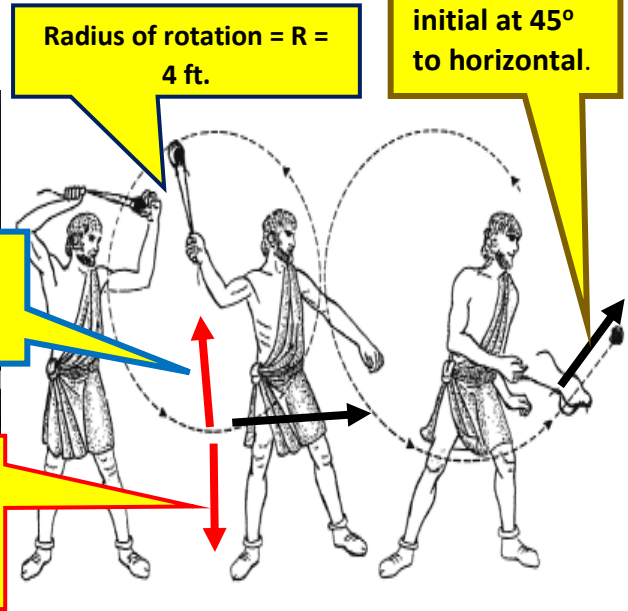


# PROJECTILES, CENTRIPETAL FORCE, ROTATION MOTION

Units 9,14, & 13 Dr. John P. Cise, Professor of Physics, Austin Com. College, Austin Tx. [jpcise@austincc.edu](mailto:jpcise@austincc.edu) & NYTimes, Dec, 8,2017 by Isabel Kershner

## Jerusalem Largely Calm as Region Protests Trump Move



### The Fallout From Trump's Jerusalem Shift

What could go wrong in the aftermath of President Trump's decision to formally recognize Jerusalem as the capital of Israel. JERUSALEM — Thousands of Palestinian protesters confronted Israeli soldiers on the Gaza border on Friday, and thousands more clashed at military checkpoints across the West Bank. Protests broke out after Friday Prayers from Beirut, Lebanon, to Istanbul, from Mogadishu, Somalia, to Tehran. In Amman, Jordan, demonstrators held large posters of President Trump bearing the words, "Go to hell." In the West Bank, scores of protesters were said to have been wounded, many by rubber-tipped bullets. But the enormous wave of violence that had been feared after [Mr. Trump's decision to formally recognize Jerusalem](#) as the capital of Israel did not immediately materialize. Hamas, the Islamic militant group that dominates Gaza, had demanded a "day of rage" on Friday, calling on Palestinians to confront Israeli forces wherever they could, and for the start of a new intifada, or popular uprising. But in the holy city itself, the main Friday Prayer at Al Aqsa Mosque was held without incident, according to the Israeli police, and the crowds that gathered afterward dispersed largely peacefully.

**INTRODUCTION:** Three goals of this application: (a) Find initial velocity of sling bullet tossed 300 ft. at a initial angle of 45 degrees. (see graphic above), (b) Knowing this initial tangential velocity ( $V$ ), find tension in sling ( $T$ ) Using centripetal force concepts, (c) Find frequency  $f$  ( in cycles/s.) which sling was spun around at prior to launch of projectile sling bullet? Data for solutions is given in the graphic above. In each case show methodology.

**QUESTIONS:** Answer three questions listed in the introduction?

#### HINTS:

Question a: Break solution to find  $V$  into two parts...Horizontal and vertical, the two equations will have two unknowns..... $t$  &  $V$ .,  $g = 32 \text{ ft./s.}^2$ ,  $x = v_{\text{horizontal}} t$ ,  $y = v_{\text{ov}} t + \frac{1}{2} g t^2$

QUESTION (b):  $(F_{\text{NET}})_{\text{CENTRIPETAL}} = m v^2/R$ , Weight =  $mg$ , 2.2 lb. = 1 kg., needed is conversion of 0.1 kg. bullet mass to pounds, mass  $m$  of sling bullet = weight in pounds/  $32 \text{ ft./s.}^2 = W/g$ , mass of sling bullet will be in units of slugs.

QUESTION (c)  $V = R \omega = R 2\pi f$

**ANSWERS:** (a)  $v = 98 \text{ ft./s.}$ , (b)  $T = \sim 16.72 \text{ lb.}$ , (c)  $f = \sim 3.7 \text{ cycles/s.}$