

WORK-ENERGY & PROJECTILES

Units 10,11,& 9 Dr. John P. Cise, Professor of Physics, Austin Com. College, Austin Tx., USA jpcise@austincc.edu & New York Times, April 13, 2018, Dedicated to ALL Religions

One Dead Amid Violence in 3rd Week of Protests at Gaza-Israel Fence

By DAVID M. HALBFINGER and IYAD ABUHEWEILA APRIL 13, 2018

GAZA CITY — Thousands of Palestinians made their way to the fence separating Gaza from Israel again on Friday, and Israeli soldiers again repulsed repeated attempts to cross or damage the barrier with tear gas and live fire, wounding hundreds. By nightfall one man was reported killed in the demonstrations, which had claimed dozens of lives on the two previous Fridays. Nearly 1,000 protesters were wounded, including 223 from gunshots, the Gaza Health Ministry said. Tear gas sufferers included 10 nurses and paramedics in the southern city of Khan Younis. Islam Herzallah, 28, of Gaza City, was shot in the abdomen and killed, bringing the overall death toll to 35. At the Shejaiya protest site east of Gaza City, where Mr. Herzallah was shot, demonstrators again used thick smoke from burning tires as cover, successfully dismantling an Israeli barrier of coiled barbed wire before retreating when Israeli soldiers shot at them. Men and even some women, covered head to toe except for their faces, hurled rocks at the Israeli side. **The Israelis liberally lobbed tear gas canisters into the large crowd as far as ((350 yards)) from the fence, sending men, women and children running, as a steady convoy of ambulances ferried away the injured.** The crowds were smaller than in the first two weeks of the protests, which began on March 30 and are being held every Friday until May 15. They are objecting to Israel's 11-year-old blockade of Gaza and seeking to revive international interest in Palestinian claims of a right of return to the lands they were displaced from in 1948.

((300 Meters in Gaza)): Snipers, Burning Tires and a Contested Fence

A fence that divides Israel and Gaza has become the latest flashpoint in the decades-old conflict, with Israeli soldiers unleashing lethal force against mostly unarmed Arab protesters.

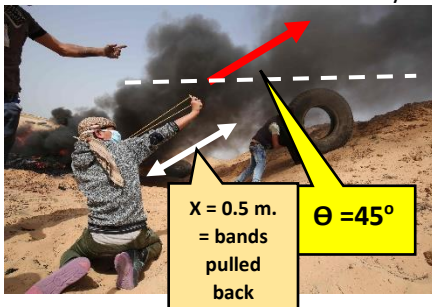


INTRODUCTION: Elastic or spring constant of rubber bands is about 40 N/m.

The sling shot being used in the lower left picture has a rubber band on each side of the sling shot. The rock being shot by the Gaza protester has a mass of 40 grams. You can see the sling shot was pulled back prior to firing about 1/2 meter. Thus, two Rubber bands provide the elastic potential energy changing into kinetic energy of Rock (0.04 kg.).

QUESTIONS: (a) Find elastic potential energy of the sling shot when pulled back 1/2 m.?, (b) Using energy conservation concepts find speed of projected 40 g. rock?

But the sharp reduction in the death toll raised questions as to whether the Israelis, reacting to international criticism and demands for investigations into possible war crimes for firing live ammunition at mainly unarmed protesters, had required soldiers to take greater care in selecting targets. snipers had been ordered only to shoot at ankles, and that every instance of gunfire was recorded by cameras fitted to gunsights. But Lt. Col. Jonathan Conricus, an army spokesman, said its rules of engagement had not changed. Hamas, the militant group that runs Gaza and has managed the protests, has insisted they were intended to be nonviolent. The Israelis have called the assertion a cynical ploy.



The demonstrations are part of a mass protest against Israel's decade-long blockade of Gaza.

QUESTIONS(continued): (c) Assuming no loss of energy due to air friction

Find distance the 40 gram rock is thrown forward and time of flight?

(d) Will the rocks reach the tanks?(note the article states the distance The protesters are from the troops is about 300 meters).

HINTS: $U_{ELASTIC} = \frac{1}{2} K X^2$ where $k = F/x$, $K = \frac{1}{2} m v^2$, $x = v_{HORIZONTAL} t$, $Y = v_o t + \frac{1}{2} g t^2$, energy is never lost, just change from one form to another. In our case $W_{FRICTION} = 0$, thus, $U_{ELASTIC} = K$, from $W = \Delta U + \Delta K$, doing projectile solutions it is best to break solution into horizontal & vertical parts

ANSWERS: (a) 10 N m. , (b) $v = 67$ m./s. , (c) $x = 459$ m., $t = \sim 9.7$ s.

(d) Yes, the tanks are said to be 300 meters away, thus the sling shots should be able to target the tanks.