

# ENERGY-WORK

Unit 10 & 11 Dr. John P. Cise, Professor of Physics, Austin Community

College, 1212 Rio Grande St Austin Tx 78701 [jpcise@austincc.edu](mailto:jpcise@austincc.edu) & NYTimes November 30,2012 by Daniel Krieger

## Putting the Bounce Back in Your Step



Kangooers rise 1 ft on each bounce

Mario Godiva leads a fitness class of students wearing Kangoo Jumps at the Complete Body gym in Manhattan.

After I quit running a few months ago because of [knee pain](#), I figured that my days of high-impact workouts were over. And they were, until I stumbled upon **a pair of bouncy, spring-loaded shoes designed for running and jumping without offending the joints.**

These rebound shoes, called [Kangoo Jumps](#), arrived in New York City when the trainer [Mario Godiva](#) moved here three years ago from Chicago with 20 pairs. The reception was lukewarm at first, he said, but after promoting Kangoos, as they are commonly known, with YouTube videos and at outdoor spaces like Union Square, Mr. Godiva built a following. Now he teaches at several fitness clubs in three formats — dancing, running and conditioning — and holds free events in clubs and parks. I tried the shoes recently at a dance class at [Complete Body](#) on West 19th Street in Manhattan, where Mr.

Godiva had me walk in them first to get my bearings. Within minutes **I felt stable enough to hop and jog.** **“The harder you push down,” he said, “the higher you go.”** But the next week, when I joined Mr. Godiva and a pack of 15 students on a two-mile jog through the meatpacking district and across the High Line, he made good on his word **“Rather than hitting the pavement, my feet landed softly because the springs absorbed most of the impact”**.

I was cheating gravity. People we passed stared in bewilderment, cheered us on or just laughed.

**INTRODUCTION:** These bouncy kangooers rise 1 ft above floor on each bounce. Their average weight is 160 lb. The spring constant(K) of springs are 1920 lb./ft.

**QUESTIONS:** (a) How much gravitational potential energy does each bouncer have after rising 1 ft? (b) When the bouncer's Fall 1 ft. to the floor what is their speed(v) after one foot fall back to floor surface? (c) How much is each kangoo spring Compressed on each bounce?

**HINT:** Energy is conserved during this bouncing process: A to B and B to C. See more hints below in graphic.

Weight(W) = mg , spring constant =K  
Note: When kangoo spring shoes bounce back to floor each spring experiences only ½ weight of person....since kangooers wear one spring on each foot each spring feels ½ weight of person. Question (c) requires you solve a quadratic eq.

**ANSWERS:** (a) 160 ft. lb. (b) 8 ft/s. (c) 0.5 ft or about ~6 inches

Answers seem very reasonable. JC

