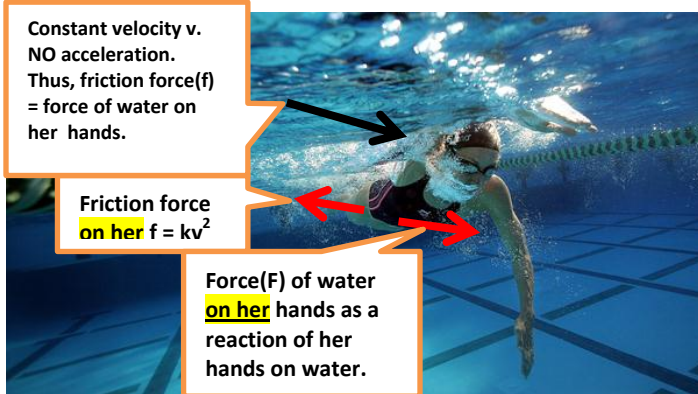


POWER = WORK/TIME = Fv ;

Unit 10, 11 Dr. John P. Cise, Professor of Physics,
Austin Com. College, 1212 Rio Grande St., Austin Tx 78701 jpcise@austincc.edu & NYTimes Feb. 22,2012 by Karen Crouse. Send Dr Cise e-mail on how used.
Thanks!

At 40, Former Olympic Champion Returns With a Different Focus



Janet Evans, working out at Golden West College in Huntington Beach, Calif., last week, has qualified for the Olympic trials in June in her signature events, the 400- and 800-meter freestyles.

(Evans still holds the American record in the 800 freestyle, 8:16.22, set in August 1989.) LAGUNA BEACH, Calif. — Shortly after Janet Evans disappeared into the bathroom, her 5-year-old daughter, Sydney, knocked on the door and said, “Can I come in, Mama?” Evans, a **five-time Olympic medalist who has returned to competitive swimming at 40**, was trying to provide a urine sample for a doping test while a woman sent by the United States Anti-Doping Agency watched. “Mommy,” Sydney said, “What are you doing in there?” How to explain to a preschooler that Mommy is swimming so fast, she has to go to the bathroom to prove she is not cheating? **In 1988, Evans, then 17 and weighing barely 100 pounds, vanquished the East Germans** — later found to be systematically doping — on her way to three Olympic gold medals in Seoul, South Korea, and instantly became a household name. She was so accomplished by her third and final Olympics, in 1996 in Atlanta, that she was chosen to pass the Olympic torch to Muhammad Ali during the opening ceremony.

Sixteen years after those Games, and a year after returning to the pool, Evans has qualified to race in her signature events, the 400- and 800-meter freestyles, at the United States Olympic trials in June. The top two finishers in each event will earn berths to the London Games.

Evans’s return to high-level competition has captivated some while confusing others. For every person who applauds her comeback after giving birth to two children and taking a 14-year hiatus from training, many others wonder about her motives given that she is a long shot to qualify for her fourth Olympics. **At the 2008 trials, it took a time of 4 minutes 3.92 seconds in the 400 and (((8:25.38 in the 800))) to make the team. Evans’s best times this year in those events are 4:17.27 and (((8:49.05)))**. Evans is not the first 40-something mom to make a big splash; the **sprinter Dara Torres, with her 2-year-old daughter in tow, won three silver medals at the 2008 Beijing Olympics at 41 and will also be competing at this year’s trials.**



Evans, 17, after her victory in the 400-meter freestyle at the 1988 Olympics in Seoul, South

Korea, where she won three gold medals.
Evans with her son, Jake, 2, and daughter,
Sydney, 5, in Laguna Beach. “I just love
seeing how happy my kids are,” she said.

INTRODUCTION: Power $P = \text{work}/\text{time} = F(x/t) = Fv$
The power Janet must put out to achieve speed v is equal to the force(F) she exerts on water(which equals the force the water exerts on her) times her speed(v). But, since she is going at constant speed(v) the force(F) she is exerting must be equal to the frictional force to the rear. Thus $F = f = kv^2$ and $P = kv^2 v = kv^3$. To qualify Janet needs to swim 800 m in 8:25(8 min & 25 s). She currently swims the 800 m in 8:49(8 min & 49 s).

QUESTIONS: (a) Find the qualifying speed(m/s)? (b) Find the speed Janet is currently swimming the 800 m ? (c) Find the % she must increase her speed to qualify? (d) Write the % increase in speed needed in decimal format? (e) Show Janet’s power output must increase about 37% to achieve qualifying speed found in (a)?

HINT: $v_{\text{qualifying}} = 1.115 v_{\text{old}}$ & $P_{\text{qualifying}} = k v_{\text{qualifying}}^3$

ANSWERS: (a)1.6842 m/s , (b) 1.5152 m/s,(c) +11.15% ,(d) 0.1115 ,
(e) $P_{\text{qualifying}} = k (1.115 v_{\text{old}})^3 = 1.37 kv_{\text{old}}^3$

