

KINEMATICS

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1212 Rio Grande St. Austin Tx 78701 jpcise@austinctc.edu & NYTimes December 28, 2012 by Keith Bradsher ; Dedicated to my wife Gertrude Cabacungan

China Opens Longest High-Speed Rail Line



China's high-speed trains at a maintenance area in Wuhan.

INTRODUCTION: These trains obey the first kinematic equation: $x = v t$, where x = distance, v = average speed, t = time.

QUESTIONS: (a) Traveling 1,200 miles in eight hrs. it is said the train does in the below article. What is the train's average speed? (b) Does answer (a) confirm the speed stated in the article? (c) Prior to a crash in July 2011 the trains were said (below) to be moving at 218 mph. How long (t) did it take a train to travel the 1,200 miles at that speed?

ANSWERS: (a) 150 mph, (b) _____, (c) 5.5 hrs

HONG KONG — China began service Wednesday morning on the world's longest [high-speed rail](#) line, **(((covering a distance in eight hours)))** that is about equal to that from New York to Key West, Fla., or from London across Europe to Belgrade, Serbia. **Trains traveling 300 kilometers, or 186 miles, an hour,** began regular service between Beijing and Guangzhou, the main metropolis in southeastern China. Older trains still in service on a parallel rail line take 21 hours; Amtrak trains from New York to Miami, a shorter distance, still take nearly 30 hours. Completion of the **(((Beijing-Guangzhou route — roughly 1,200 miles)))** — is the latest sign that China has resumed rapid construction on one of the world's largest and most ambitious infrastructure projects, a network of four north-south routes and four east-west routes that span the country. Worries about the high-speed network peaked in July 2011, when one high-speed train plowed into the back of another near Wenzhou in southeastern China, killing 40 people. A subsequent investigation blamed flawed signaling equipment for the crash. **(((China had been operating high-speed trains at 350 kilometers an hour (about 218 m.ph.), and it cut the top speed to the current rate in response to that crash.)))** The crash crystallized worries about the haste with which China has built its high-speed rail system. The first line, from Beijing to Tianjin, opened a week before the 2008 Olympics; a little more than four years later, the country now has 9,349 kilometers, or 5,809 miles, of high-speed lines. Flights between Beijing and Guangzhou take about three hours and 15 minutes. But air travelers in China need to arrive at least an hour before a flight, compared with 20 minutes for high-speed trains, and the airports tend to be farther from the centers of cities than the high-speed train stations. **The 664-mile southern segment of the new high-speed rail line, from Guangzhou as far as Wuhan, has been open for nearly three years.** The trains, which come every four to 12 minutes, are often packed, which could limit the number of seats available for travel to Beijing.