

## Exercises – Word problems: rational equations

1. One Halloween evening a wizard and a witch counted the number of Snickers Bars they had each received as a result their trick-or-treat expedition. The witch simply counted that he had received 7 Snicker Bars. The wizard, being a math genius, noticed that if he divided 6 times the number of Snickers Bars that he received by five less than that number, he would have the square of the number of Snickers Bars that he had received. Who had more Snickers Bars?
2. An aging king decided that it was time to divide his vast land among his three daughters—Goneril, Regan and Cordelia. He decided to have them race for the amount of land that they would acquire. Each would get a square piece that was as large as the square of the distance they ran in 1 hour. Goneril's average speed was 2 miles/hour less than Regan's, but 3 miles/hour faster than Cordelia's. How much land did the king leave to Cordelia?
3. A harried parent leaves his house during rush-hour each weekday to fetch his wife at the railroad station and return to pick up his child from school. His house, station and school are equal distance of 1 mile from each other. (On an imaginary triangle.) He usually makes the whole trip in 15 minutes. Because of heavy traffic at rush-hour, he averages 10 miles/hour slower between the station and the school. How fast is his speed between the house and the station?
4. A sorcerer's love potion boils over and leaves a huge pool of potion in his laboratory. He knows that if he asks his apprentice to clean it up, it would take 20 minutes longer than if he did it himself. So he decides to have the apprentice help him do the job. Together, they clean the mess in 30 minutes. How long would it have taken if the sorcerer did the job alone ?
5. A Patriot missile is launched at the same time as a Scud missile and is aimed at destroying the Scud . The Scud is traveling at the rate of 1000 miles/hour, while the Patriot is traveling at 800 miles/hour. If it takes two minutes for

them to be within 1000 feet from each other, What is the distance between their launching sites?

6. A company manufactures computer terminals and receives a contract for designing a new model terminal. It specifies that the new model should have a screen that is 2 inches narrower and 5 inches taller than the old model. If the total screen area of the old model was 36 square inches and new model is 10 square inches larger than the old, what are the dimensions of the old model?
7. Two speed boats depart from a harbor and head in opposite directions on a river. The river speed, relative to the ground is 14 miles per hour. After 8 minutes they are 20 miles apart. Find the speed of each boat.
8. A police car arrives at the scene of a robbery of The Fifth National Bank of Hometown, just as the thief in a get-away car rounds a corner 1000 yards away. The police car chases after the thief at an average speed of 70 miles per hour. If the get-away car averages 55 miles per hour, how long will it be before the cop catches the thief?