Quantitative reasoning: Dealing with units

1. When the basketball scouts for the Los Angeles Dodgers were looking at bringing Hideo Nomo to this country to pitch for the Dodgers, they must have been interested in knowing the speed of his fastball. In Korea, his fastball was clocked at 43 meters per second. The scouts would have wanted to know the speed in miles per hour. What speed in miles per hour is 43 meters per second?

2. Nolan Ryan has been clocked throwing a baseball 100 miles per hour. At that speed how much time (in seconds) does the batter have to react? (How much time before the ball hits the plate?) The pitcher’s mound is 60 feet, 6 inches from the home plate.

3. A car is traveling at 65 miles per hour, gets 25 miles per gallon and travels 45 minutes. How many gallons does the car use during that time?

4. Allyson is a nurse in the intensive care unit of a hospital. She works with units daily, administering drugs through intravenous (IV) tubes. A common dosage for the drug dopamine is 2 to 5 micrograms per kilogram of body weight per minute. She will put 400 milligrams of the dopamine into 250 cubic centimeters of fluid and administer it to patient through an IV tube. At what rate, in cubic centimeters per hour, should she set the flow to achieve a dosage of 3 micrograms per kilogram per minute into a patient with a mass of 75 kilograms?