

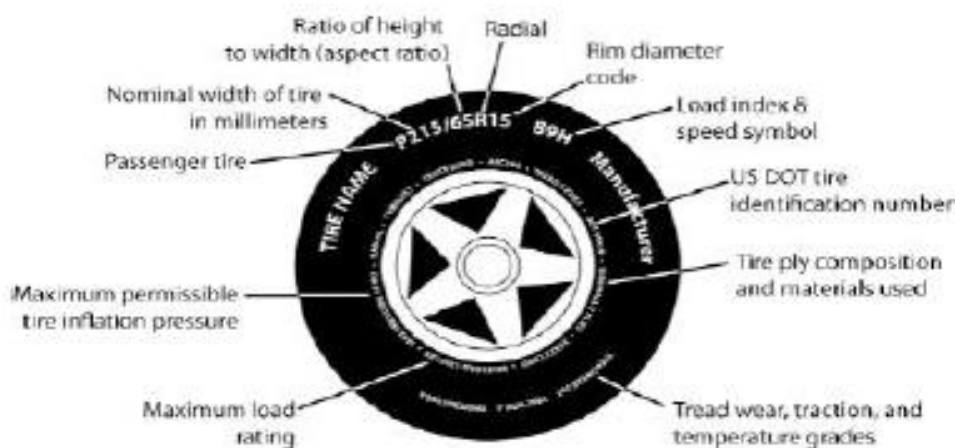
## Analyzing Numerical Data: Using Ratios

### I.B Student Activity Sheet 5: Changing Tires

You have just purchased a new vehicle equipped with factory-installed P245/70R16 tires. You think those tires look too small, so you replace them with P285/75R16 tires. How does this change in tire size affect the accuracy of speedometer and odometer readings? Specifically, your goal is to complete the following statements:

If your odometer reading is 20000, you have actually traveled \_\_\_\_\_ miles.

If your speedometer reading is 60, your actual speed is \_\_\_\_\_ miles per hour.



The calibration of a vehicle's speedometer and odometer is based on the circumference of the vehicle's factory-installed tires. For the P245/70R16 tires,

- P means passenger tire;
- 245 specifies the tire's width in millimeters;
- 70 is the tire's aspect ratio—that is, the ratio of the tire's height to its width reported as a percent; and
- 16 is the diameter of the tire's rim in inches.



TIRE	P245/70R16	P285/75R16
Width (mm) <i>Found in the reading display</i>		
Aspect Ratio <i>Found in the reading display</i>		
Height (mm)		
Height (in.) <i>Convert from previous answer</i>		
TOTAL diameter (in.) <i>Include rim and heights</i>		
CIRCUMFERENCE (in.)		

2. What is the RATIO of the new big tire to the smaller tire?
3. So for every one rotation of the original tire, the big tire has travelled \_\_\_\_\_ times more
4. If the settings on the dashboard were never changed from the factory settings and your **speedometer** read 60 mph, how fast are you actually travelling? EXPLAIN how you know.
5. If the settings on the dashboard were never changed from the factory settings and your **odometer** read 20,000 miles, how far have you actually driven? EXPLAIN how you know.
6. A cop pulled you over for speeding. You have the new P285/75R16 tires on your car and never changed the dashboard settings. You look at your speedometer and it says 65 mph.
  - a. Are you speeding? If so, by how much?
  - b. Can you talk your way out of this ticket? Explain how you could or could not below.