Name _____

9-6A Lesson Master

Questions on SPUR Objectives
See Student Edition pages 656–659 for objectives.

SKILLS Objective C

In 1 and 2, use this information. The pH scale measures the strength of acids and bases. Its formula is $pH = -\log(H^+)$ where H^+ is the concentration of hydrogen ions, measured in moles per liter.

1. A type of hand soap has a concentration of hydrogen ions of 3.16×10^{-9} moles per liter. Find its pH.   _____

2. The pH of lemon juice is 2.4. Find the concentration of hydrogen ions.   _____

In 3 and 4, use this information. The decibel scale of relative sound intensity is based on watts. The watt is a measure of power. The formula $D = 10 \log\left(\dfrac{N}{10^{-12}}\right)$ relates sound intensity N in watts per square meter to its relative intensity D in decibels.

3. A school lunchroom has a noise level of 1.58×10^{-4} watts per square meter. Find the decibel level in the lunchroom.   _____

4. A car horn is rated at 110 decibels. Find its power in watts per square meter.   _____

USES Objective I

5. The table at the right shows the pH values of common beverages.

   a. Which is the most acidic? _____

   b. How many times as acidic as tomato juice is orange juice? _____

   c. How many times as acidic as milk is cola?   _____

Beverage	pH
Cola	2.5
Orange Juice	3.5
Tomato Juice	4.0
Milk	6.0

6. Two companies manufacture lawnmowers. Company A's model is rated at 89 decibels. Company B advertises their model as "half as loud as the competition." How loud is Company B's lawnmower, in decibels?   _____

7. Recall that the scales for measuring earthquakes are logarithmic, so that an increase of 1.0 in intensity corresponds to a ten-fold increase in the earthquake's power. In 2005, an earthquake of magnitude 7.6 struck Pakistan. In 2008, a magnitude 7.9 earthquake struck Sichuan, China. How many times as strong as the 2005 earthquake was the 2008 one?   _____