Dimensional Analysis Homework Problems

You may use a calculator to solve these problems at home, but not during the quiz. You must show your work to receive full credit during the quiz.

1. A car drives 360 miles and averages 30 miles per gallon. If gas cost $4 per gallon, then how much did the gasoline for the trip cost?

2. An average human heart beats at about 60 beats per minute. About how many times will a heart beat per year?

3. Use the following information to figure out how many pounds 16 gallons of water would weigh.

   - 1 gallon is 3.79 liters
   - 1 liter of water is 1 kilogram
   - 1 kilogram is 2.20 pounds

4. A 2 liter bottle of soda contains 8.5 servings. If each serving has 120 calories, then how many calories would you get if you drank half the bottle?

5. A football field is 100 yards long. A yard is 3 feet. A mile is 5280 feet. A marathon is 26.2 miles. Running a marathon would be the same as running the length of how many football fields?

6. Mulch costs 5 cents per pound. How much will 7 tons of mulch cost (in dollars)?

7. A person earning minimum wage ($7.25) who works 40 hours per week, 50 weeks per year will earn how much per year?

8. If the person from the last problem has 15.3% of her income withheld because of payroll (Medicare and Social Security) taxes, how much will they actually make each year?

9. A farmer has 2 square miles of land. Suppose each acre produces 115 bushells of corn (640 acres is 1 square mile). A bushell of corn weighs 56 lbs. How many tons of corn should the farmer expect this year?