Chemistry 141 Name

Dr. Cary Willard

Quiz 1a (20 points) January 31, 2012

1. (5 points) The value of the Euro is currently $1.32 US and the price of 1 L of gasoline in France is 1.23 Euro. What is the price of 1 gallon of gas in U.S. dollars in France?

$$?\$=1 gal×\frac{4 qt}{1 gal}×\frac{1 L}{1.06 qt}×\frac{1.23 E}{1 L}×\frac{\$1.32}{1 Euro}=\$6.12$$

1. (5 points) Total U.S. farmland occupies 954 million acres. How many square miles is this? (1 acre = 43,560 ft2; 1 mile = 5280 ft)

$$?mi^{2}=954×10^{6}acres×\frac{43560 ft^{2}}{1 acre}×\left(\frac{1 mi}{5280 ft}\right)^{2}=1.49×10^{6} mi^{2}$$

1. (6 points) On a new Jekyll temperature scale, water freezes at 17oJ and boils at 97oJ. On another new temperature scale, the Hyde scale, water freezes at 0oH and boils at 120oH. If ethyl alcohol boils at 94oH, what is its boiling point on the Jekyll scale?

80oJ=120oH

$$\left(94°H×\frac{80°J}{120°H}\right)+17=63+17=80°J$$

1. (4 points) An automobile gasoline tank holds 23 kg of gasoline. When the gasoline burns, 92 kg of oxygen is consumed and carbon dioxide and water are produced. What is the total combined mass of carbon dioxide and water that is produced?

$$23+92=mass CO\_{2} and H\_{2}O=115 kg$$

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Quiz 1b (20 points) January 31, 2012

1. (5 points) The value of the Euro is currently $1.32 US and the price of 1 L of gasoline in Germany is 1.13 Euro. What is the price of 1 gallon of gas in U.S. dollars in Germany?

$$?\$=1 gal×\frac{4 qt}{1 gal}×\frac{1 L}{1.06 qt}×\frac{1.13 E}{1 L}×\frac{\$1.32}{1 Euro}=\$5.63$$

1. (5 points) Total U.S. farmland occupies 954 million acres. How many square miles is this? (1 acre = 43,560 ft2; 1 mile = 5280 ft)

$$?mi^{2}=954×10^{6}acres×\frac{43560 ft^{2}}{1 acre}×\left(\frac{1 mi}{5280 ft}\right)^{2}=1.49×10^{6} mi^{2}$$

1. (6 points) On a new Jekyll temperature scale, water freezes at 17oJ and boils at 97oJ. On another new temperature scale, the Hyde scale, water freezes at 0oH and boils at 120oH. If isopropyl alcohol boils at 98oH, what is its boiling point on the Jekyll scale?

80oJ=120oH

$$\left(98°H×\frac{80°J}{120°H}\right)+17=65+17=82°J$$

1. (4 points) An automobile gasoline tank holds 18 kg of gasoline. When the gasoline burns, 72 kg of oxygen is consumed and carbon dioxide and water are produced. What is the total combined mass of carbon dioxide and water that is produced?

$$18+72=mass CO\_{2} and H\_{2}O=90 kg$$