Chemistry 115 Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Quiz 2a

Dr. Cary Willard February 13, 2013

All work must be shown to receive credit. Use correct significant figures.

1. (5 points) The distance between San Diego and Phoenix is 355 miles. What is this distance in km? (5280 ft = 1 mile)

$$?km=355 mi×\frac{5280 ft}{1 mi}×\frac{12 in}{1ft}×\frac{2.54 cm}{1 in}×\frac{1 m}{100 cm}×\frac{1 km}{1000 m}=571 km$$

1. (5 points) The density of magnesium is 1.74 g/mL. What is the mass in kg of a magnesium statue with a volume of 24.7 L?

$$?kg=24.7 L×\frac{1000 mL}{1 L}×\frac{1.74 g}{1 mL}×\frac{1 kg}{1000 g}=43.0 kg$$

1. (5 points) If 48.5 mL of methanol are produced in a fermentation vat every day, what is the rate of production in gallons of methanol per year? (1 gal = 4 qt)

$$? \frac{gal}{year}=\frac{48.5 mL}{day}×\frac{1 qt}{946 mL}×\frac{1 gal}{4 qt}×\frac{365 day}{1 yr}=\frac{4.67 gal}{yr}$$

1. (5 points) The temperature on an average winter day in Ithaca, New York is 8oC. What is this temperature in oF? In K?

$$℉=\left(8℃×\frac{180℉}{100℃}\right)+32℉=14℉+32℉=46℉$$

$$K=8℃+273=281 K$$

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Quiz 2b

Dr. Cary Willard February 13, 2013

All work must be shown to receive credit. Use correct significant figures.

1. (5 points) The distance between San Diego and Tucson is 408 miles. What is this distance in km? (5280 ft = 1 mile)

$$?km=408 mi×\frac{5280 ft}{1 mi}×\frac{12 in}{1ft}×\frac{2.54 cm}{1 in}×\frac{1 m}{100 cm}×\frac{1 km}{1000 m}=657 km$$

1. (5 points) The density of magnesium is 1.74 g/mL. What is the mass in kg of a magnesium statue with a volume of 31.8 L?

$$?kg=31.8 L×\frac{1000 mL}{1 L}×\frac{1.74 g}{1 mL}×\frac{1 kg}{1000 g}=55.3 kg$$

1. (5 points) If 76.4 mL of methanol are produced in a fermentation vat every day, what is the rate of production in gallons of methanol per year? (1 gal = 4 qt)

$$? \frac{gal}{year}=\frac{76.4 mL}{day}×\frac{1 qt}{946 mL}×\frac{1 gal}{4 qt}×\frac{365 day}{1 yr}=\frac{7.37 gal}{yr}$$

1. (5 points) The temperature on an average summer day in Ithaca, New York is 33oC. What is this temperature in oF? In K?

$$℉=\left(33℃×\frac{180℉}{100℃}\right)+32℉=59℉+32℉=91℉$$

$$K=33℃+273=306 K$$

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Quiz 2c

Dr. Cary Willard February 13, 2013

All work must be shown to receive credit. Use correct significant figures.

1. (5 points) One of the fish tanks at Sea World holds 752 gallons of water. How many kiloliters of water are in this fish tank? (1 gal = 4 qt)

$$?km=752 gal×\frac{4 qt}{1 gal}×\frac{946 mL}{1 qt}×\frac{1 L}{1000 mL}×\frac{1 kL}{1000 L}=2.85 kL$$

1. (5 points) The density of magnesium is 1.74 g/mL. What is the volume in L of a magnesium statue with a mass of 73.4 kg?

$$?L=73.4 kg×\frac{1000 g}{1 kg}×\frac{1 mL}{1.74 g}×\frac{1 L}{1000 mL}=42.2 L$$

1. (5 points) If crepe myrtle trees grow at a rate of 3.97 feet per year, what is the rate of growth in terms of centimeters per day?

$$? \frac{cm}{day}=\frac{3.97 ft}{yr}×\frac{12 in}{1 ft}×\frac{2.54 cm}{1 in}×\frac{1 yr}{365 day}=\frac{0.332 cm}{day}$$

1. (5 points) The temperature on an average winter day in Phoenix, AZ is 16oC. What is this temperature in oF? In K?

$$℉=\left(16℃×\frac{180℉}{100℃}\right)+32℉=29℉+32℉=61℉$$

$$K=16℃+273=289 K$$

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Quiz 2d

Dr. Cary Willard February 13, 2013

All work must be shown to receive credit. Use correct significant figures.

1. (5 points) One of the fish tanks at Sea World holds 937 gallons of water. How many kiloliters of water are in this fish tank? (1 gal = 4 qt)

$$?km=937 gal×\frac{4 qt}{1 gal}×\frac{946 mL}{1 qt}×\frac{1 L}{1000 mL}×\frac{1 kL}{1000 L}=3.55 kL$$

1. (5 points) The density of magnesium is 1.74 g/mL. What is the volume in L of a magnesium statue with a mass of 81.9 kg?

$$?L=81.9 kg×\frac{1000 g}{1 kg}×\frac{1 mL}{1.74 g}×\frac{1 L}{1000 mL}=47.1 L$$

1. (5 points) If crepe myrtle trees grow at a rate of 4.24 feet per year, what is the rate of growth in terms of centimeters per day?

$$? \frac{cm}{day}=\frac{4.24 ft}{yr}×\frac{12 in}{1 ft}×\frac{2.54 cm}{1 in}×\frac{1 yr}{365 day}=\frac{0.354 cm}{day}$$

1. (5 points) The temperature on an average summer day in Phoenix, AZ is 41oC. What is this temperature in oF? In K?

$$℉=\left(41℃×\frac{180℉}{100℃}\right)+32℉=74℉+32℉=106℉$$

$$K=41℃+273=314 K$$