MATH 1123 : Homework 2 **Name _____**

1) The Colosseum was used for entertainment for 390 years. During this time more than 400,000 people died inside the Colosseum. It's also estimated that about 1,000,000 animals died in the Colosseum as well.

   a) Use fraction multiplication to estimate the number of animals that died in the Colosseum each day.

   b) Use fraction multiplication to estimate the number of animals that died in the Colosseum for each person that died.

2) The shifts in climate in the Sahara Desert are due to a 41000-year cycle. During this cycle, the earth changes its tilt from 22 to 24.5 degrees

   a) Use fraction multiplication to estimate the number of degrees the Earth's tilt changes in 10,000 years.

   b) Use fraction multiplication to estimate the number of years it takes for the Earth's tilt changes by 10 degrees.

3) Hummingbirds are birds native to the Americas and constitute the biological family Trochilidae. They are among the smallest of birds, most species measuring 7.5–13 cm (3–5 in) in length. Indeed, the smallest extant bird species is a hummingbird, the 5 cm (2.0 in) bee hummingbird weighing less than 2.0 g (0.07 oz).

They are known as hummingbirds because of the humming sound created by their beating wings which flap at high frequencies audible to humans. They hover in mid-air at rapid wing-flapping rates, which vary from around 12 beats per second in the largest species, to in excess of 80 in some of the smallest. Of those species that have been measured in wind tunnels, their top speed exceeds 15 m/s (54 km/h; 34 mph) and some species can dive at speeds in excess of 22 m/s (79 km/h; 49 mph).

Hummingbirds have the greatest mass-specific metabolic rate of any homeothermic animal. To conserve energy when food is scarce, and nightly when not foraging, they can go into torpor, a state similar to hibernation, slowing metabolic rate to 1/15th of its normal rate

-Wikipedia

a) Use fraction multiplication to calculate the number of times a humming bird would flap its wings if it hovered for a day.

b) How long would it take for a humming bird to flap its wings 1,000,000 times?

c) At a sustained top speed, how long would it take a humming bird to fly across the United States? (Use fraction multiplication.)

4) Below are some rates involving fictional units. Use these relationships to calculate the following conversions.

$5\ rubbles\ =\ 7\ concats$

$8.5\ dackmores\ =\ 11\ felds$

$2.5\ sanzies\ =\ 14\ cubits$

$4\ drapers\ =\ 17\ liomons$

$8.5\ dackmores\ =\ 11\ cubits$

$9\ drapers\ =\ 2\ sanzies$

$7\ rubbles\ =\ 3.3\ felds$

$6.5\ concats\ =\ 2\ liomons$

Using fraction multiplication…

a) Convert $3\ sanzies$ into $dackmores$

b) Convert $100\ cubits$ into $drapers$

c) Convert $13\ concats$ into $liomons$

5) Represent the following rates as fractions of measurements and equations of measurements.

a) $15\ pounds$ per $crate$

b) $45\ N$ per $7\ in^2$

c) $3.8\ MPa$ per $2\ min$

d) $100\ yds$ per $field$

e) $0.25\ g$ per $5\ cm^3$

f) $15000\ Ohms$ per $2.75\ feet$

6) Translate the following fractions into phrases and equations.

a) $\frac{30\ mg}{1\ mL}$

b) $\frac{15\ amps}{2\ min}$

c) $\frac{2.2\ volts}{1\ turn}$

d) $\frac{1500\ watts}{13\ hours}$

7) Represent the following amounts as fractions.

a) $1.8\ amps$

b) $25\ N$

c) $97\ feet$

d) $34\ coulombs$

e) $123\ °\mathrm{F}$

8) Multiply the following amounts and rates. Simplify to an amount.

a) $12\ miles\ per\ hour\ \cdot\ 6\ hours$

b) $\frac{15\ amps}{2\ min}\ \cdot 7\ min$

c) $9\ turns\ \cdot\ \frac{2.2\ volts}{1\ turn}$

d) $\frac{1500\ watts}{13\ hours}\ \cdot 24\ hours$

9) Solve the following equations for the needed $\boldsymbol{RATE}$.

a) $20\ pounds\ \cdot \boldsymbol{RATE} = 80\ minutes$

b) $10\ beats\ \cdot \boldsymbol{RATE} = 70\ mL$

c) $150\ sec\ \cdot \boldsymbol{RATE} = 15\ amps$

d) $12\ mm^2\ \cdot \boldsymbol{RATE} = 48\ N$

10) Solve the following equations for the needed $\boldsymbol{AMOUNT}$.

a) $\frac{2\ psi}{10°\mathrm{F}} \cdot \boldsymbol{AMOUNT} = 5.5\ psi$

b) $\frac{1\ volt}{2.5\ in} \cdot \boldsymbol{AMOUNT} = 3.4\ volts$

c) $\frac{300\ kN}{2.5\ m} \cdot \boldsymbol{AMOUNT} = 750\ kN$