

MATH123 Quantitative Reasoning Section 11 Temperature and Dimensional Analysis

- 13.) I arrive home to find that my 50 foot by 40 foot basement has 18 inches of water in it.
- If 1 cubic foot is about 7.48 gallons, how much water will I be pumping out of my basement?
 - If you have a pump that can empty 1000 gallons of water per hour, how long will it take to dry out the basement?
- 14.) Some species of hummingbirds appear to hover in mid-air by flapping their tiny wings 80 times per second. How many times do their wings flap in one minute?
- 15.) People blink about ten times per minute, how many times per hour do they blink?
- 16.) Convert 1 km/hr (kilometers per hour) to meters per second (m/s).
- 17.) A snail crawls at a pace of 5.0 cm/min (centimeters per minute). What is the snail's pace in feet per second?
- 18.) A swimming pool is being filled at the rate of 15 pints per minute. How many gallons per hour is this?
- 19.) A pony keg (quarter barrel) of beer contains 62 pints. If the local drinking establishment sells draft beer in 300 mL pilsner glasses, how many pilsners are in each pony keg?
- 20.) A general contractor is constructing a building that requires a concrete foundation that is to be 20 feet by 12 feet and 4 inches thick. If the local home supply store sells concrete for \$125 per cubic yard, what will be the cost of the concrete for the foundation?
- 21.) A car gets 25 mpg. How many miles per liter is this?
- 22.) Is it safe to drive 110 kph (kilometers per hour) on the highway? Why?
- 23.) Which is the better buy: 1 liter of soda for \$1, or 1 gallon of soda for \$4? Justify your answer.
- 24.) Which is the better buy: 1 pound of candy for \$3, or 1 kg of candy for \$6? Justify your answer.

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- 4.) What is the area in square inches of an ordinary piece of copier paper?
- 5.) What is the volume in cubic feet of a greenhouse that is 20 feet long, 15 feet wide, and 10 feet high?
- 6.) How many square centimeters are in 1 square foot?
- 7.) You are ordering linoleum for an 18' by 15' kitchen, but when you get to the store the measurements are in square yards, how much should you order?
- 8.) Is the following statement reasonable? (Justify your answer!) The area of a dorm room is 49 m^2 .
- 9.) You build three raised garden boxes that are 12 feet by 6 feet and 10 inches tall. The supply store sells garden soil in cubic yards.
- How many cubic yards of soil will you need (you can disregard the thickness of the wood)?
 - If soil is priced at \$5 per cubic yard, how much will it cost to fill your boxes?
- 10.) On average, cleaning a dairy cow's stall produces 0.6 ft^3 of waste material per day.
- If a farm has 100 dairy cows, how much cubic feet of waste will they clear in a year?
 - There are $43,560 \text{ ft}^2$ in 1 acre. How many acres of land would the farmer need to spread the waste on if he wanted it no more than 6 inches deep?
- 11.) A round silo is 60 feet tall and has a 15 foot radius. About how high would a load of $32,000 \text{ ft}^3$ of grain fill the silo to?
- 12.) A cylindrical shaped vase has a radius of 3 cm and a height of 18 cm.
- How much water would it take to completely fill the vase?
 - How much water is needed to fill the vase $\frac{3}{4}$ of the way?