**Show Factor-Label Setup when appropriate. Show formulas used and values plugged in when appropriate.**

1. On a sunny day in Ottawa, the outside temperature is . As a visiting US citizen, you quickly convert this to degrees Fahrenheit. What value do you get?
2. Marcelle, your French foreign exchange student, rushes into the kitchen one December morning in a panic. She has heard on the local radio station that the high temperature today will be 30 degrees. Marcelle is very concerned about this unusually warm temperature during the winter. To calm Marcelle you must “translate” the local temperature into degrees Celsius. What value do you get?
3. What is the area in square inches of an ordinary piece of copier paper?
4. What is the volume in cubic feet of a greenhouse that is 20 feet long, 15 feet wide, and 10 feet high?
5. How many square centimeters are in 1 square foot?
6. 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?
7. Is the following statement reasonable? (Justify your answer!) The area of a dorm room is 49 m2.
8. 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.
   1. How many cubic yards of soil will you need (you can disregard the thickness of the wood)?
   2. If soil is priced at $5 per cubic yard, how much will it cost to fill your boxes?
9. On average, cleaning a dairy cow’s stall produces 0.6 ft3 of waste material per day.
10. If a farm has 100 dairy cows, how much cubic feet of waste will they clear in a year?
11. There are 43,560 ft2 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?
12. A round silo is 60 feet tall and has a 15 foot radius. About how high would a load of 32,000 ft3 of grain fill the silo to?
13. A cylindrical shaped vase has a radius of 3 cm and a height of 18 cm.
    1. How much water would it take to completely fill the vase?
    2. How much water is needed to fill the vase ¾ of the way?
14. I arrive home to find that my 50 foot by 40 foot basement has 18 inches of water in it.
15. If 1 cubic foot is about 7.48 gallons, how much water will I be pumping out of my basement?
16. If you have a pump that can empty 1000 gallons of water per hour, how long will it take to dry out the basement?
17. 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?
18. 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?
19. A certain drug dosage calls for 25mg per kg per day and is divided into two doses (1 every 12 hours). If a person weighs 180 pounds, how much of the drug should they get each dosage?
20. If a drug has a concentration of 275 mg per 10 mL, how many mL are needed to give 1 gram of the drug?