Pesticide Math Problems

1. How many acres are in a field that measures 385 feet long by 225 feet wide?
   Hint: one acre = 43,560 square ft.

   Solution: Find total area = Length x Width

   $$385\ ft \times 225\ ft = 86{,}625 ft^2$$

   Convert sq. ft. to acres:

   $$\frac{86{,}625 ft^2}{43{,}560 ft^2} = 1.98\ acres \approx 2\ acres$$

2. How many acres can you spray with a full tank if the tank holds 1000 gallons, and you are spraying at 8 GPA ?

   Solution:

   $$\frac{1000\ gal/tank}{8\ gal/Acre} = 125\ acres$$

3. How many gallons of herbicide do you need to mix a full tank?
   Tank capacity = 100 gallons
   Spray volume = 12.5 GPA
   Product rate = 2 pints product per acre
   Tractor speed = 10 MPH
   Hint: first determine how many acres you can spray with a full tank
   Hint: there may be more information than you need.

   Solution: Determine how many acres can be sprayed with a full tank:

   $$\frac{100\ gals/tank}{12.5\ gal/Acre} = 8\ acres\ per\ tank$$

   Use product rate to how many gallons herbicide needed:

   $$8\ acres\ \times \frac{2\ pints}{1\ acre} \times \frac{1\ gal}{8\ pints} = 2\ gal$$

4. How much 75W herbicide do you need to treat 1500 acres if the recommended application rate is 0.3 pounds active ingredient per acre?
   Hint: divide the amount you need (lbs. ai) by the percent in the product

Solution:

$$\frac{3 \ lb \ AI/A}{75\% \ AI} = 0.4 \ lbs \ product/A$$

$$0.4 \ lbs \ product/A \times 1{,}500 \ acres = 600 \ lbs$$

5. How much 2E herbicide do you need to treat 1500 acres if the recommended application rate is 0.3 pounds active ingredient per acre?
   Hint: divide the amount you need (lbs ai) by the amount in the formulation (lbs/gal)

   Solution:

   $$\frac{0.3 \ lb \ ai}{2 \ lbs \ AI/gal} = 0.15 \ gal/A$$

   $$0.15\frac{gal}{A} \times 1500 \ A = 225 \ gal$$

6. How many fluid ounces of wetting agent do you need for a 75 gallon tank if the herbicide label recommends adding a surfactant at 0.5% v/v?
   Hint: in the last step, convert gallons to ounces
   Hint: 0.5% = 0.005

   Solution:

   $$75 \ gal \times 0.005 = .375 \ gals$$

   $$0.375 \ gals \ x \ 128 \ oz/gal = 48 \ fl \ oz$$

7. You are spraying herbicide in 24" bands in rows that are 36" apart.   If your field is 2 acres, how many acres are actually treated?

   Solution:

   $$\frac{24 \ in}{36 \ in} \times 2 \ acres = 1.33 \ acres$$