Practice problems

1. A farmer wishes to apply atrazine at 3lbs ai/A. How much Aatrex Nine-O will be needed per acre?
   We want to know lbs Aatrex/acre

$$\frac{3 \text{ lbs ai atrazine}}{\text{acre}} \times \frac{\text{Aatrex}}{90\% \text{ ai atrazine}} = \frac{3}{0.9} = \boxed{\frac{3.33 \text{ lbs Aatrex}}{\text{acre}}}$$

2. A farmer wishes to apply 2,4-D at 0.25 lb ae/A to barley. Saber herbicide contains 3.8 lb of 2,4-D ae/gal. How many pints of product should be applied per acre? How many total gallons of herbicide will be applied to a 50 acre field?
   We want to know pints Saber/acre

$$\frac{0.25 \text{ lb ae}}{\text{acre}} \times \frac{1 \text{ gal Saber}}{3.8 \text{ lb ae}} \times \frac{8 \text{ pints}}{1 \text{ gal}} = \frac{0.25*8}{3.8} = \boxed{\frac{0.53 \text{ pints Saber}}{\text{acre}}}$$

   We want to know gallons

$$\frac{0.53 \text{ pints}}{\text{acre}} \times \frac{1 \text{ gal}}{8 \text{ pints}} \times \frac{50 \text{ acres}}{} = \frac{0.53*50}{8} = \boxed{3.3 \text{ gallons}}$$

3. Picloram can be applied to wheat at 0.25 oz ae/A. Tordon 22K contains picloram at 2 lb ae/gal. How many acres can be treated with 1 gal of Tordon 22K?
   Want to know acres/gallon

$$\frac{1 \text{ acre}}{0.25 \text{ oz ae}} \times \frac{2 \text{ lbs ae}}{1 \text{ gal}} \times \frac{16 \text{ oz}}{1 \text{ lb}} = \frac{2*16}{0.25} = \boxed{\frac{128 \text{ acres}}{\text{gal}}}$$

4. You have calibrated your equipment to spray 50 gallons per acre. You need to spray 1 acre. The label calls for 3 pounds of formulation per 100 gallons of water. How many pounds of formulation should you add to the tank to make 50 gallons of finished spray?
   Want to know lbs formulation

$$\frac{3 \text{ lbs form.}}{100 \text{ gal}} \times \frac{50 \text{ gal}}{} = \frac{3*50}{100} = \boxed{1.5 \text{ lbs formulation}}$$

5. A sprayer with a tank capacity of 300 gallons is calibrated for an application rate of 30 gallons per acre. An 85% wettable powder herbicide is to be applied. The label recommends applying 3 pounds of active ingredient per acre. How many pounds of herbicide product should be added to the spray tank?
   We want to know lbs product/tank

$$\frac{300 \text{ gal}}{1 \text{ tank}} \times \frac{3 \text{ lbs ai}}{\text{acre}} \times \frac{1 \text{ acre}}{30 \text{ gal}} \times \frac{\text{product}}{0.85 \text{ ai}} = \frac{300*3}{30*0.85} = \boxed{\frac{35.3 \text{ lbs product}}{\text{tank}}}$$

6. How many acres can be treated from a spray tank holding 400 gallons if the rate of application is 20 gallons per acre?
   Want to know acres/tank

$$\frac{400\ \cancel{gal}}{1\ tank} \times \frac{1\ acre}{20\ \cancel{gal}} = \frac{400}{20} = \boxed{\frac{20\ acres}{tank}}$$

7. You have a 5 acre grass pasture that is heavily infested with Canada thistle. To get rid of the thistle you decide to treat it with Tordon 22K (2.0 lb ai/gal) at a recommended rate of 1.0 lb ai/a. Your 200 gal sprayer delivers 35 gal/a of water. How much Tordon 22K should be added to the spray tank to treat the 5 acre pasture?

   Want to know gallons of Tordon

   $$\frac{1\ \cancel{lb\ ai}}{\cancel{acre}} \times \frac{1\ gal\ Tordon}{2\ \cancel{lb\ ai}} \times \frac{5\ \cancel{acres}}{} = \frac{5}{2} = \boxed{2.5\ gal\ Tordon}$$

   a. Assuming same pasture as question 16, how much water should be added to the spray tank to treat the 5 acre pasture?

      Want to know gallons of water

      $$\frac{35\ gal}{\cancel{acre}} \times \frac{5\ \cancel{acre}}{} = \frac{35*5}{} = \frac{175\ gal\ of\ total\ solution}{} - \frac{2.5\ gal\ of\ Tordon}{} = \boxed{172.5\ gallons\ of\ water}$$

8. An applicator needs to spray a 35 acre field using Ally (60% df). The label directions recommend that 0.1 oz product/acre be applied. The applicator has a 200 gallon spray tank with a spray width of 33 ft. He measured off 132 ft. in the field, filled the spray tank to a given level with water, sprayed the measured distance and refilled the tank with 2 gallons of water.

   a. What is the spray rate in gallons/acre?

      We want to know gal/acre

      $$\frac{2\ gal}{33\ \cancel{ft} * 132\ \cancel{ft}} \times \frac{43560\ \cancel{sq\ ft}}{1\ acre} = \frac{2*43560}{33*132} = \boxed{\frac{20\ gal}{acre}}$$

   b. How many acres can be sprayed with a full tank?

      We want to know acres

      $$\frac{1\ acre}{20\ \cancel{gal}} \times \frac{200\ \cancel{gal}}{} = \frac{200}{20} = \boxed{10\ acres}$$

   c. How many gallons are needed to spray the 35 acres?

      We want to know gallons

      $$\frac{20\ gal}{1\ \cancel{acre}} \times \frac{35\ \cancel{acres}}{} = \frac{20*35}{1} = \boxed{700\ gallons}$$

   d. How much Ally needs to be added to a full tank?

      We want to know Ally/tank

      $$\frac{10\ \cancel{acres}}{tank} \times \frac{0.1\ oz\ Ally}{\cancel{acre}} = \frac{10*0.1}{1} = \boxed{\frac{1\ oz\ Ally}{tank}}$$

   e. How many ounces of Ally are needed to treat the 35 acres?

      We want to know oz Ally

      $$\frac{0.1\ oz\ Ally}{\cancel{acre}} \times \frac{35\ \cancel{acres}}{} = \frac{35*0.1}{1} = \boxed{3.5\ oz\ Ally}$$