**Activity 4.5.3 More Equations and Problems**

Solve:

1. $5\left(x+7\right)-2\left(5x-8\right)= -2x-3\left(x-7\right)$
2. $x^{2}+10x+28=4$
3. Working together it takes 3 hours for a new teacher and an experienced teacher to set up a bulletin board. It the new teacher did it alone it would take her 7 hours. How long would it take the experienced teacher to set up the bulletin board by herself?
4. $\sqrt{x+8}=4$
5. $\sqrt{4x+8 }=x-1$
6. A beaker contains 10 ounces of a liquid that is 12 % alcohol. You need to add water to make the alcohol concentration 9%. How much water must you add?
7. $\left(x-9\right)\left(x+3\right)= -5$
8. Find the zeros (Real and Complex) of $f\left(x\right)= x^{3}+3x^{2}-x-3$.
9. Find the zeros (Real and Complex) of $g\left(x\right)= x^{3}-3x^{2}+x-3$.
10. You have probably had a rushing ambulance come toward you with loud sirens while in the car. The pitch of the siren sound (measure of the frequency) is high getting louder but as soon as the ambulance passes you, it is less. This phenomenon is the Doppler Effect—the apparent shift in frequency of sound waves produced by a moving source. The observed frequency of the sound, f0 when a source is traveling toward you is given by the formula f0 = $(f\_{s}c/(c-v\_{s})$ where fs is the emitted frequency; c, the velocity of the sound and vs is the velocity of the source coming toward you.

If a vehicle is coming toward you at 65 mph or 104.6 km/hr and it sounds its horn at 8000Hz, what is the frequency of the sound you hear when the speed of the sound is 340 m/sec (1115ft/sec)? Hint: Use metric and make sure all your units match. Look up Hz if you need to.

1. A farmer wants to enclose a rectangular field by a fence and divide it into two smaller rectangular fields by a fence parallel to one side of the field. He has 3600 feet of fencing . Find the dimensions of the field so that so that the total enclosed area is a maximum.