1 gal = 8 pt
1 gal = 4 qt
1 qt = 2 pt
1 pt = 2 c

G4-M7-Lesson 6

1. Determine the following sums and differences. Show your work.

a. 2 gal 3 qt + 2 qt = __3__ gal __1__ qt

1 qt 1 qt

I decompose and rename units to help me solve. Then, I add or subtract like units.

b. 5 qt − 3 pt = __3__ qt __1__ pt

3 pt —(+1 pt)→ 2 qt —(+3 qt)→ 5 qt

1 qt 1 pt

I use the arrow way counting up to 5 quarts from 3 pints. I rename 3 pints as 1 quart 1 pint and then add on 1 pint to reach 2 quarts. Finally, I add on 3 quarts to reach 5 quarts. The answer is the sum of what was added on.

c. 7 gal 1 pt − 2 pt = __6__ gal __7__ pt

6 gal 9 pt

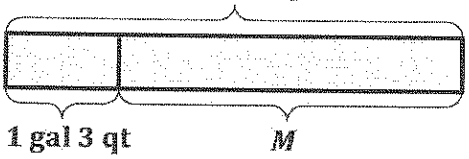
I rename 1 gallon as 8 pints.

d. 2 qt 3 c + 3 c = __3__ qt __2__ c

2 qt 3 c + 3 c = 2 qt 6 c = 3 qt 2 c

1 qt 2 c

2. The capacity of the container is 4 gallons 2 quarts of liquid. Right now, 1 gallon 3 quarts of liquid are in the container. How much more liquid will the container hold?



4 gal 2 qt − 1 gal 3 qt = 2 gal 3 qt

3 gal 6 qt

M = 2 gal 3 qt

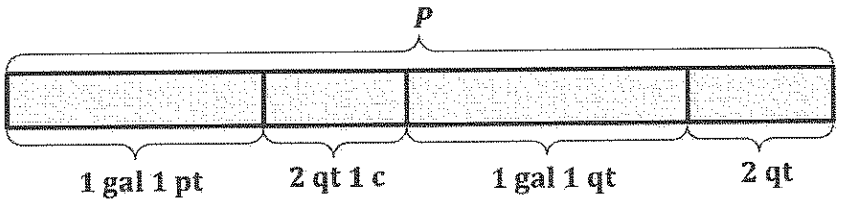
The container will hold 2 gallons 3 quarts more liquid.

I rename 4 gallons 2 quarts as 3 gallons 6 quarts so that there are enough quarts to subtract 3 quarts.

3. Grant and Emma follow the recipe in the table to make punch.

Punch Recipe	
Ingredient	**Amount**
Fruit Punch	1 gal 1 pt
Ginger Ale	2 qt 1 c
Pineapple Juice	1 gal 1 qt
Orange Sherbet	2 qt

a. How much punch does the recipe make?



$P = 1\text{ gal } 1\text{ pt} + 2\text{ qt } 1\text{ c} + 1\text{ gal } 1\text{ qt} + 2\text{ qt}$
$= 2\text{ gal } 5\text{ qt } 1\text{ pt } 1\text{ c}$
$= 1\text{ gal} \quad 4\text{ c} \quad 2\text{ c}$
$= 3\text{ gal } 7\text{ c}$

I could rename this as 3 gallons 1 quart 3 cups, but naming a measurement with 3 units is uncommon. I think to other measurements with 2 units: hours and minutes, weeks and days, feet and inches, pounds and ounces, and dollars and cents.

The recipe makes 3 gallons 7 cups of punch.

b. How many more cups of liquid would they need to fill a 5-gallon container?

$3\text{ gal } 7\text{ c} \xrightarrow{+9\text{ c}} 4\text{ gal} \xrightarrow{+16\text{ c}} 5\text{ gal}$

There are 16 cups in 1 gallon. I count up 9 cups to reach 4 gallons, and then I add 16 cups, or 1 gallon, to reach 5 gallons.

They would need 25 more cups of liquid to fill a 5-gallon container.