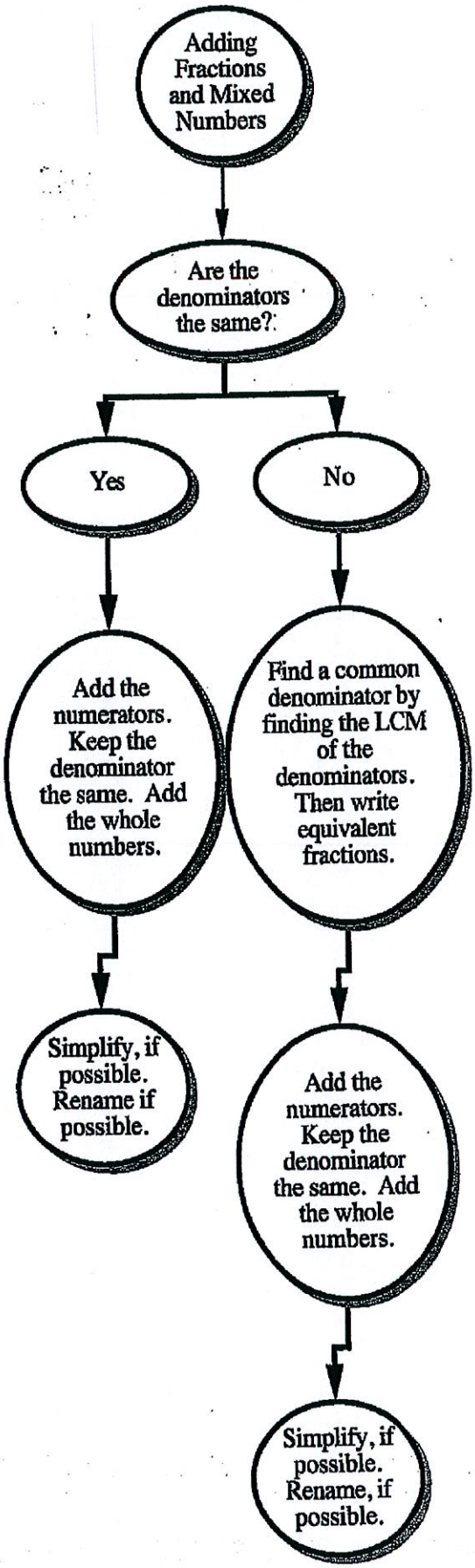
# Seventh Grade Summer Review Sheet

## Adding Fractions



## Adding Fractions and Mixed Numbers

**Find each sum.**

1. Ex. 1: $\frac{11}{12} + \frac{5}{12}$

$$\begin{array}{r} \frac{11}{12} \\ +\frac{5}{12} \\ \hline \end{array}$$

$$\frac{11+5}{12} = \frac{16 \div 4}{12 \div 4} = \frac{4}{3} = \boxed{1\frac{1}{3}}$$

2. Ex. 2: $\frac{5}{8} + \frac{3}{18}$

$$\begin{array}{r} \frac{5}{8} \times\frac{9}{9} = \frac{45}{72} \\ +\frac{3}{18} \times\frac{4}{4} = +\frac{12}{72} \\ \hline \end{array}$$

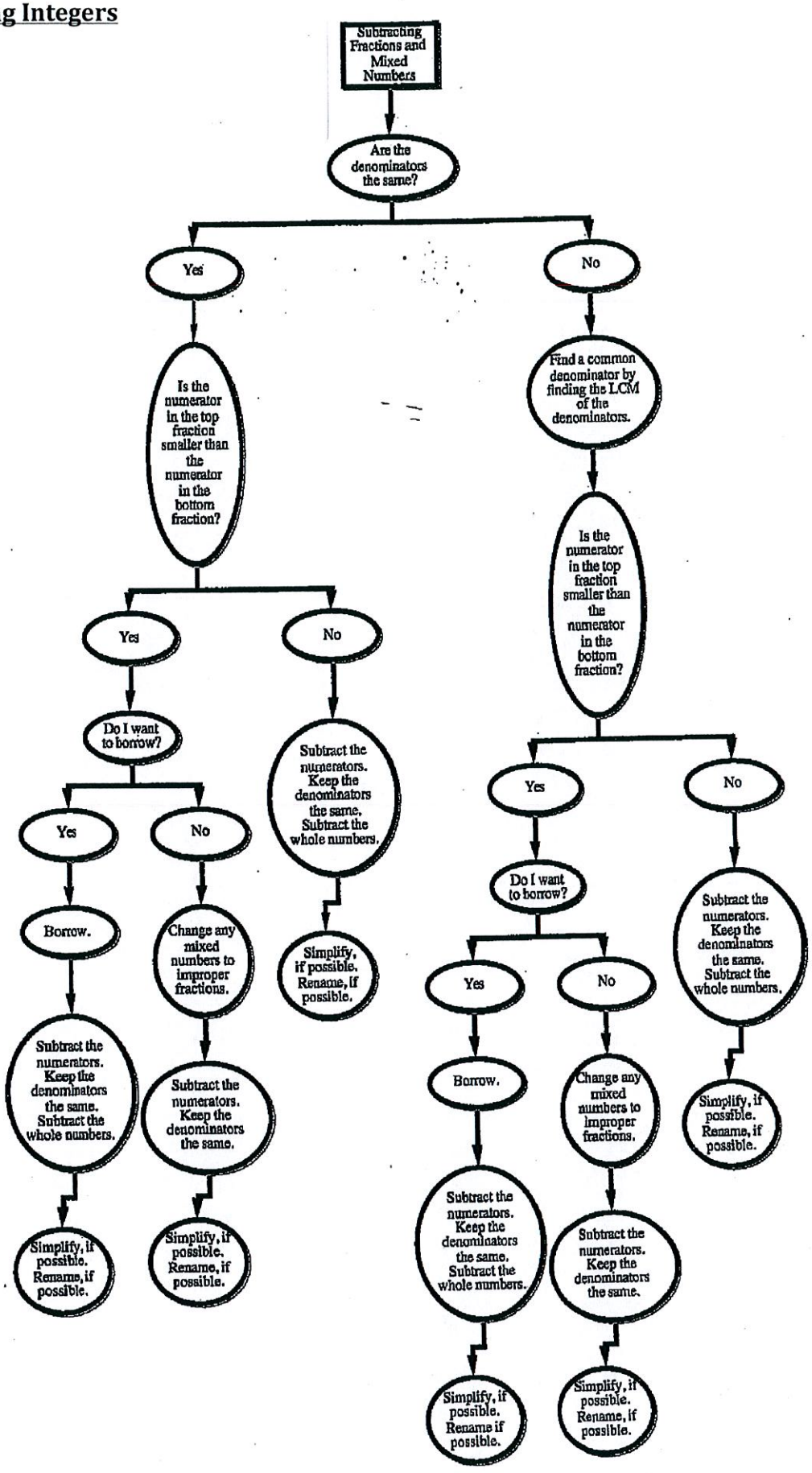
$$\frac{45+12}{72} = \frac{57 \div 3}{72 \div 3} = \boxed{\frac{19}{24}}$$

3. Ex. 3: $1\frac{1}{3} + 2\frac{3}{4}$

$$\begin{array}{r} 1\frac{1}{3} \times\frac{4}{4} = 1\frac{4}{12} \\ +2\frac{3}{4} \times\frac{3}{3} = +2\frac{9}{12} \\ \hline \end{array}$$

$$1+2\ \frac{4+9}{12} = 3\frac{13}{12} = \boxed{4\frac{1}{12}}$$

## Subtracting Integers



## Subtracting Fractions and Mixed Numbers

**Find each difference.**

1. Ex. 1: $\frac{11}{15} - \frac{8}{15}$

$$\frac{11}{15} - \frac{8}{15}$$

$$\frac{11-8}{15} = \frac{3 \div 3}{15 \div 3} = \boxed{\frac{1}{5}}$$

2. Ex. 2: $\frac{11}{12} - \frac{5}{8}$

$$\frac{11 \times 2}{12 \times 2} = \frac{22}{24}$$

$$-\frac{5 \times 3}{8 \times 3} = -\frac{15}{24}$$

$$\frac{22-15}{24} = \boxed{\frac{7}{24}}$$

3. Ex. 3: $6\frac{3}{4} - 2\frac{1}{4}$

$$6\frac{3}{4} - 2\frac{1}{4}$$

$$6 - 2\frac{3-1}{4} = 4\frac{2 \div 2}{4 \div 2} = \boxed{4\frac{1}{2}}$$

4. Ex. 4: $6\frac{3}{8} - 3\frac{3}{4}$

$$6\frac{3}{8} = 6\frac{3}{8} = 5\frac{11}{8}$$

$$-3\frac{3 \times 2}{4 \times 2} = -3\frac{6}{8} = -3\frac{6}{8}$$

$$5 - 3\frac{11-6}{8} = \boxed{2\frac{5}{8}}$$

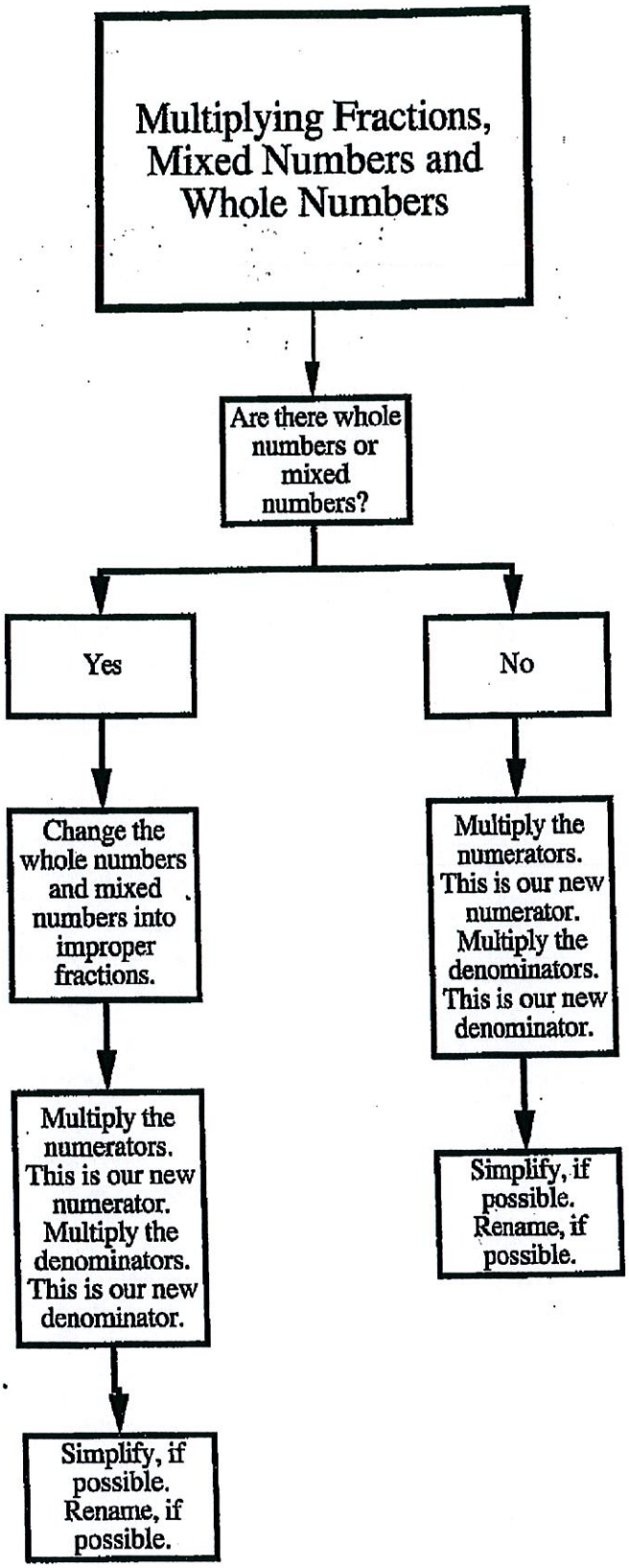
OR

$$6\frac{3}{8} = 6\frac{3}{8} = \frac{51}{8}$$

$$-3\frac{3 \times 2}{4 \times 2} = -3\frac{5}{8} = -\frac{29}{8}$$

$$\frac{51-29}{8} = \frac{22}{8} = \boxed{2\frac{5}{8}}$$

**Multiplying Integers**



## Multiplying Fractions, Mixed Numbers, and Whole Numbers

**Find each product.**

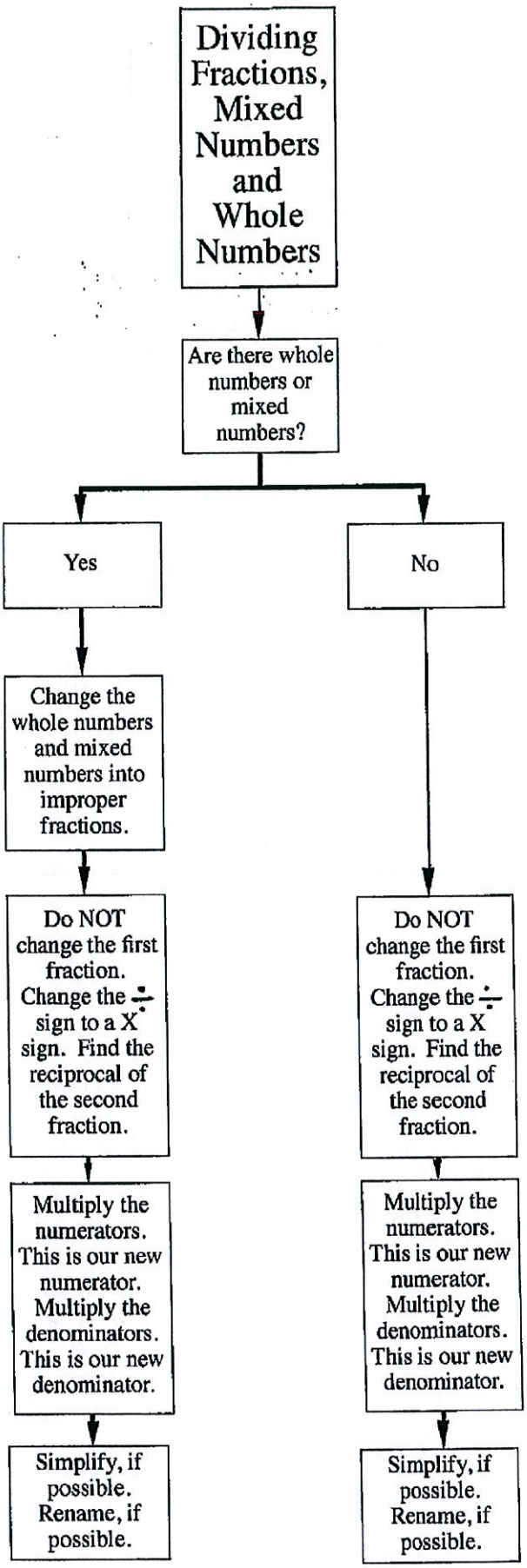
1. Ex. 1: $\frac{5}{6} \times \frac{3}{10} = \frac{5 \times 3}{6 \times 10} = \frac{15 \div 5}{60 \div 5} = \frac{3 \div 3}{12 \div 3} = \boxed{\frac{1}{4}}$

2. Ex. 2: $4\frac{1}{2} \times 3\frac{5}{6} = \frac{9}{2} \times \frac{23}{6} = \frac{9 \times 23}{2 \times 6} = \frac{207 \div 3}{12 \div 3} = \frac{69}{4} = \boxed{17\frac{1}{4}}$

3. Ex. 3: $\frac{2}{3}$ of $16 = \frac{2}{3} \times \frac{16}{1} = \frac{2 \times 16}{3 \times 1} = \frac{32}{3} = \boxed{10\frac{2}{3}}$

4. Ex. 4: $6 \times 2\frac{1}{3} = \frac{6}{1} \times \frac{7}{3} = \frac{6 \times 7}{1 \times 3} = \frac{42}{3} = \boxed{14}$

**Dividing Integers**



## Dividing Fractions, Mixed Numbers, and Whole Numbers

**1. reciprocals:** two numbers that have a product of 1; to find a reciprocal of a number switch the numerator and denominator

Ex: Find the reciprocal of each.

a. $\frac{2}{7}$ reciprocal: $\boxed{\frac{7}{2}}$

b. $9 = \frac{9}{1}$ reciprocal: $\boxed{\frac{1}{9}}$

c. $2\frac{1}{5} = \frac{11}{5}$ reciprocal: $\boxed{\frac{5}{11}}$

**2. Find each quotient.**

1. Ex. 1: $\frac{6}{7} \div \frac{3}{4} = \frac{6}{7} \times \frac{4}{3} = \frac{6 \times 4}{7 \times 3} = \frac{24 \div 3}{21 \div 3} = \frac{8}{7} = \boxed{1\frac{1}{7}}$

2. Ex 2: $3\frac{1}{4} \div 2\frac{3}{10} = \frac{13}{4} \div \frac{23}{10} = \frac{13}{4} \times \frac{10}{23} = \frac{130 \div 2}{92 \div 2} = \frac{65}{46} = \boxed{1\frac{19}{46}}$

3. Ex. 3: $4 \div \frac{1}{3} = \frac{4}{1} \div \frac{1}{3} = \frac{4}{1} \times \frac{3}{1} = \frac{4 \times 3}{1 \times 1} = \frac{12}{1} = \boxed{12}$

4. Ex. 4: $2\frac{1}{2} \div 5 = \frac{5}{2} \div \frac{5}{1} = \frac{5}{2} \times \frac{1}{5} = \frac{5 \times 1}{2 \times 5} = \frac{5 \div 5}{10 \div 5} = \boxed{\frac{1}{2}}$

## Solving GCF and LCM Problems

The largest number that is a factor of two or more whole numbers is the **greatest common factor (GCF)** of the numbers. The smallest number (other than zero) that is a multiple of two or more whole numbers is the **least common multiple (LCM)** of the numbers.

Method 1: Use a list.

**Example:**

1. Find the GCF and LCM of 18 and 30.

   factors of 18: 1, 2, 3, 6, 9, and 18
   factors of 30: 1, 2, 3, 5, 6, 10, 15, and 30
   GCF = 6

   multiples of 18: 18, 36, 54, 72, 90, 108, ...
   multiples of 30: 30, 60, 90, ...
   LCM = 90

Method 2: Use prime factorization.

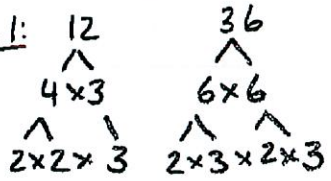
Finding GCF using prime factorization:

Step 1: Find the prime factorization of each number.
Step 2: Identify the common prime factors.
Step 3: Multiply the common prime factors to find the GCF.

Ex 1: Find the GCF of each of the following using prime factorization.

a. 12 and 36

Step 1:




Step 2: $12: 2\times2\times3 = 2^2\times3$

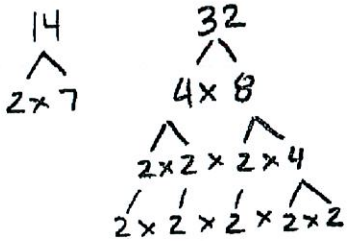
$36: 2\times2\times3\times3 = 2^2\times3^2$

Step 3: $GCF = 2\times2\times3 = 2^2\times3$

$= \boxed{12}$

b. 14 and 32

Step 1:




Step 2: $14: 2\times7$

$32: 2\times2\times2\times2\times2 = 2^5$

Step 3: $GCF = \boxed{2}$

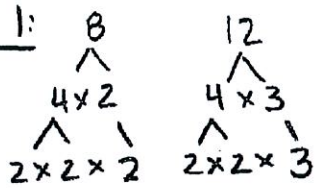
Finding LCM using prime factorization:

Step 1: Find the prime factorization of each number.
Step 2: Find the shortest string of prime factors that contains the prime factorization of the numbers.
Step 3: Multiply the string. The product is the LCM.

Ex 1: Find the LCM of each of the following using prime factorization.

a. 8 and 12

Step 1:




Step 2:

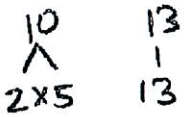
| | 2 | 3 |
|---|---|---|
| $8 = 2\times2\times2 = 2^3$ | 3 | 0 |
| $12 = 2\times2\times3 = 2^2\times3$ | 2 | 1 |

Step 3: $LCM = 2\times2\times2\times3 = 2^3\times3$

$= \boxed{24}$

b. 10 and 13

Step 1:




Step 2:

| | 2 | 5 | 13 |
|---|---|---|---|
| $10 = 2\times5$ | 1 | 1 | 0 |
| $13 = 13$ | 0 | 0 | 1 |

Step 3: $LCM = 2\times5\times13 = \boxed{130}$

**Examples:**

1. You go to the library every 8 days. Your best friend goes to the library 14 days. You saw each other at the library today. In how many days will you see your best friend at the library again?

**This is an LCM problem.**

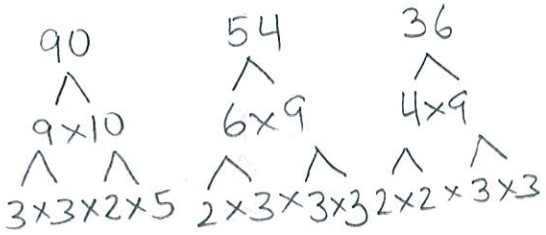
**multiples of 8: 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, ...**

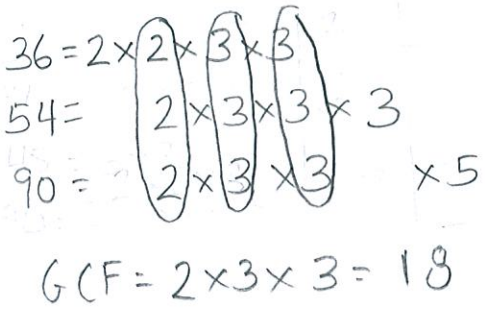
**multiples of 14: 14, 28, 42, 56, ...**

**LCM = 56, so you and your best friend will see each other at the library again in 56 days.**

2. Your mom wants to make gift bags for your little brother's birthday party. She bought 90 bags of fruit snacks, 36 packs of cookies, and 54 candy bars. What is the largest number of gift bags your mom can make so that each item is equally shared for each gift bag?

**This is a GCF problem.**




**The GCF = 18, so the largest number of gift bags your mom can make is 18. There would be 5 bags of fruit snacks, 2 packs of cookies, and 3 candy bars in each gift bag.**