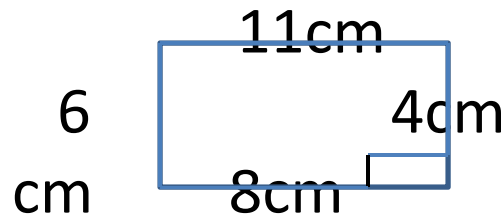


# Math III: Do Now

1.  $2005 - 205 = 1300 + ?$
2. Joan bought some cookies , each of which costs \$3. She gave the salesperson \$10 and received \$1 as change. How many cookies did she buy?
3. Eva lives with her parents, her brother, one dog, two cats, two parrots, and four fish. What is the total number of legs that they have altogether?
4. John has a chocolate bar consisting of square pieces 1 cm x 1 cm in size. He has already eaten some of the corner pieces. How many pieces does John have left?



5. It's noon time now. What time will it be after 17 quarters of an hour?

# Math IV: Do Now

1.  $2005 + 2005 \times 100 = ?$
2. On a shelf, there are 24 balls in three colors: white, red and brown.  $\frac{1}{8}$  of them are white, and  $\frac{2}{3}$  of the rest of the balls are red. How many of them are brown?
3. Tom picked a natural number and multiplied by 3. Which number CANNOT be the result of this multiplication? A)987 B)444 C)204 D)105 E)103
4. What is the number of all divisors of 100?  
Note: divisors are factors
5. In a two-digit number,  $a$  is the tens digit and  $b$  is the ones digit. Which of the conditions below ensures that the number will be divisible by 6? A)  $a+b=6$  B)  $b=6a$  C)  $b=5a$  D)  $b=2a$  E)  $a=2b$

# Lesson Objectives

1. To investigate common factors and multiples of two or more counting numbers.
2. To practice and familiarize the types of questions asked on Math Olympiad contests.
3. To sketch and/or organize data from word problems and attempt to solve the problem.

# GCF and LCM

- Greatest Common Factor (GCF) is the largest factor that is common in 2 or more numbers.
- Example: the GCF of 12 and 20 is 4 since the
- factors of 12 are 1,2,3,4,6,12.
- The factors of 20 are 1,2,4,5,10,20.

You try: find the GCF of 18 and 57. Ans: 3

- Least Common Multiple(LCM) is the smallest multiple that is common in 2 or more number.
- Example: the LCM of 5 and 8 is 40 since the
- Multiples of 4 are 5,10,15,20,25,30,35,40...
- Multiples of 8 are 8,16,24,32,40,48...

You try: find the LCM of 8 and 10. Ans: 40

# MO Practice Problems

1. Rectangular cards, measuring 2 inches by 3 inches are cut from a rectangular sheet measuring 3 ft by 2 ft. What is the greatest number of cards that can be cut from the sheet.

First, convert ft to inches so the units are the same.  $3 \text{ ft} = 36$  inches.  $2 \text{ ft} = 24$  inches. Since we want to try to fit as many small cards into the big sheet, we are looking for how many times the small card area can go into the big sheet (area). The card area is 6 square inches. The big sheet area is  $36 \times 24$  or 864 square inches. So  $864/6 = 144$  (the units cancel). So a maximum of 144 cards can be cut from the sheet.

# More Math Olympiads

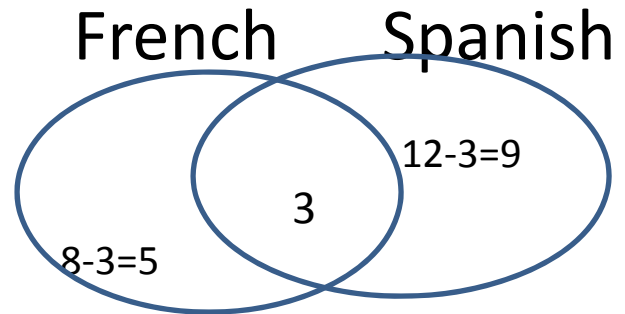
10. Six people participated in a checker tournament. Each participant played exactly 3 games with each of the other participants. How many games were played in all?

Name the players 1, 2, 3, 4, 5, 6. Let --  
1x2, 1x3, 1x4, 1x5, 1x6  
(5 games).  
2x3, 2x4, 2x5, 2x6 (4 games).  
3x4, 3x5, 3x6 (3 games).  
4x5, 4x6 (2 games). Finally,  
5x6 (1 game). Do you see a pattern? So a total of 15 games played by 6 players each facing a different opponent. Note Key word: *exactly 3 games with each other*. So multiply  $15 \times 3$  to get 45 total games in all.

# More practice problems

4. In a group of 30 high school students, 8 take French, 12 take Spanish, 3 take both languages. How many students of the group take neither French nor Spanish?

Total students = 30 but only  $5+3+9=17$  take either French or Spanish or both. This means 13 students take neither languages since  $13+17=30$ .



# Homework (Due Oct 17)

- Math III

- 1) Use Power Point notes from the last 2 lectures to finish all pages upto p32 in the reader.
- 2) Elementary Math Olympiad booklet: Chapter 2, drawing a picture: 2.2 Exercises: #2,3,4,11-15 (pages 9,11, 13)

- Math IV

- 1) Use Power Point notes from the last 2 lectures to all the pages upto p32 in the reader.
- 2) Finish Singapore Math section, pages 17-22, including exercises 4&5 (pages 12-15)
- 3) Elementary Math Olympiad section (back of the reader):Chapter2, drawing a picture, pages 9-14, 2.2 Exercises: #2-4, 6-20