Let's assume a "combo" to this lock is 3 different numbers.

Why is the phrase Combination Lock not a good name?

Because the order to enter the numbers is very important. Therefore, these should be calle Permutation Locks.

Find all possible "combos".

$$_{40}P_3$$

The lottery game Mega Millions requires you to pick 5 numbers from 1 to 56 then pick the Gold Ball which is a number from 1 to 46.

1. If you buy an Easy Pick ticket then the computer picks these numbers for you. How many different Easy Pick tickets are possible?

ways to pick 5 of 56 numbers $$\left(_{56}C_5\right) \cdot \left(_{46}C_1\right)$$ # of ways to pick 1 of 46 numbers $=175,711,536$

2. What is the probability that you get a winning ticket? $$\frac{1}{175,711,536}$$

There are 10 swimmers in a race. How many ways can the gold, silver, and bronze medals be awarded?

$$_{10}P_3$$

There are 10 swimmers on a team. How many ways can three co-captains be selected?

$$_{10}C_3$$

There are 12 players on a basketball team. How many ways can I pick 5 players to start the game.

$$_{12}C_5$$

How many different ways can the 5 starting players be announced at the beginning of the game?

$$_{12}P_5$$

1. You have to reshelve 8 books at the library.

a. How many ways can you (arrange) all of these books on a shelf?

$$_8P_8 = 8! =$$

b. How many ways can you arrange 5 of these books on a shelf?

$$_8P_5 = 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4$$

2. There are 8 books from the library that you want to read but you can only check out a maximum of three books at a time. How many ways can you check out three of these books?
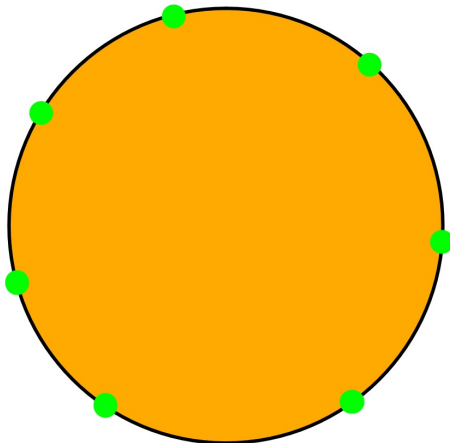
$$_8C_3$$

This is a garage door opener keypad. If the code consists of 4 digits how many codes are possible if:

1. A number can't be repeated.

$$10 \cdot 9 \cdot 8 \cdot 7 \qquad \text{or} \qquad _{10}P_4$$

2. A number can be repeated.

$$10 \cdot 10 \cdot 10 \cdot 10$$

or 0000 to 9999 is 10,000 numbers

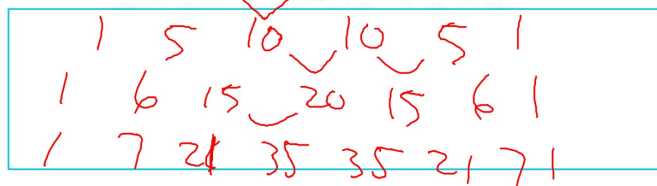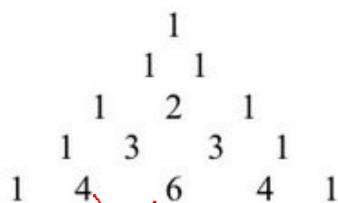How many triangles can be formed by connecting three of these points?
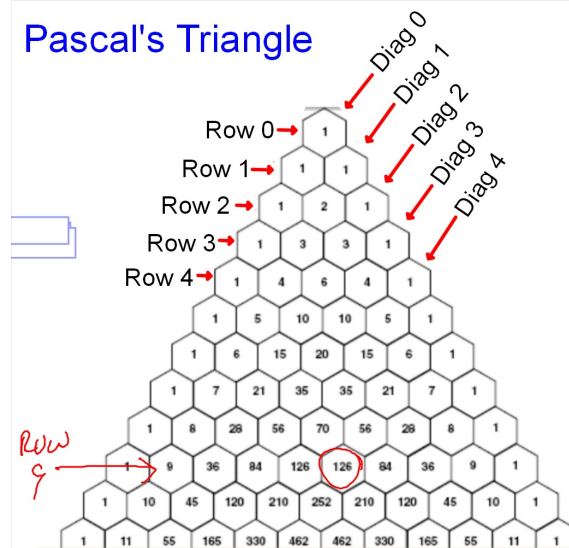
$$_7C_3 = 35$$

Hwk #23:   Sec 6-7

pages 348-349

Problems 9, 18, 20, 29-32, 39, 40

Find the next two rows of this pattern


```
            1
          1   1
        1   2   1
      1   3   3   1
    1   4   6   4   1
```

1   5   10   10   5   1
1   6   15   20   15   6   1
1   7   21   35   35   21   7   1

Pascal's Triangle

what # is
in Row 9

diag 5 = 126

$_9C_5 = 126$

Use your calculator to find each of these

$_5C_2 = 10$

$_4C_3 = 4$

$_6C_4 = 15$

$_8C_5 = 56$

Pascal's Triangle

$_5C_2 = 10$
$_4C_3 = 4$
$_6C_4 = 15$
$_8C_5 = 56$