

Math 4d. Classwork 19.  
**Coordinates.**



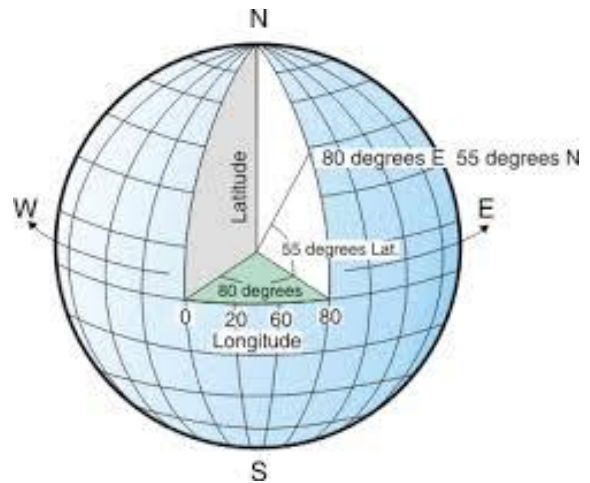
Can you imagine any other algorithm to link a point in a plane and a pair of numbers  
 Earth coordinate system:

A *geographic coordinate system* uses a three-dimensional spherical surface to determine locations on the earth.

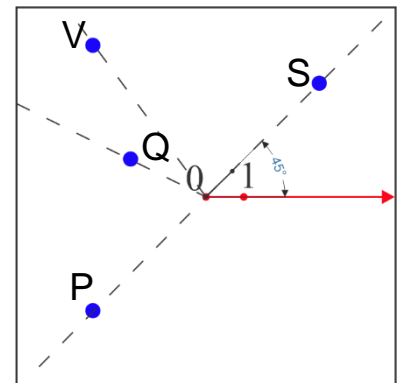
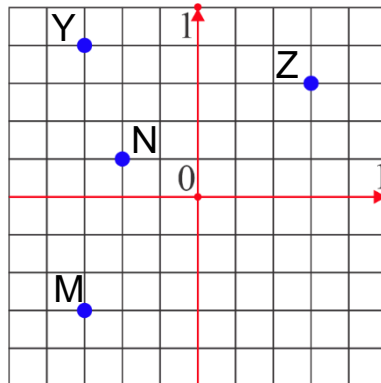
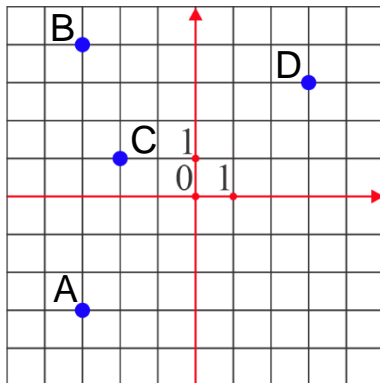
Any location on earth can be referenced by a point with longitude and latitude coordinates.

The values for the points can have the following units of measurement:

- Decimal degrees
- Decimal minutes
- Decimal seconds



Find the coordinate of the points on the pictures:



Now let's solve some more problems.

1. in 10 minutes. Peter can eat the same cake in 15 minutes, How fast they will eat the same cake together?

These kind of problems are related to the amount of work done per unit of time. To solve the problem, we have to find out what part of the cake Mary will eat in 1 minute. If she can eat the whole cake in 10 minutes, she only eats  $\frac{1}{10}$  of the cake in one minute. Peter will eat  $\frac{1}{15}$  of the cake in 1 minute. If they will start eating the cake simultaneously, each minute



$$\frac{1}{10} + \frac{1}{15} = \frac{3}{30} + \frac{2}{30} = \frac{5}{30} = \frac{1}{6}$$

will be eaten. We don't know, how many minutes are needed, but the rate with which the cake will be disappearing  $\frac{1}{6}$  per minute:

$$x(\text{minutes}) \cdot \frac{1}{6}(\text{part of the cake}) = 1(\text{whole cake})$$

So, they will need exactly

$$x = 1(\text{whole cake}) : \frac{1}{6}(\text{parts}) = 1 \cdot 6 = 6 \text{ minutes}$$

2. Mary, Peter, and Julia are going to do the spring clean up in their garden. Mary can do the job in 4 hours, Peter can do the full clean up in 3 hours, Julia need 6 hours to do the job. How fast they will do it together?
3. A swimming pool can be filled by pipe A in 3hours and by pipe B in 6 hours , each pump working on its own . At 9am pump A is started. At what time will the swimming pool be filled if pump B is started at 10am ?
4. A swimming pool can be filled in 12 hours and emptied in 18 hours. One day while the pool is being filled, the drain is accidentally left open. How long will it take to fill the pool?