**Precalculus Unit 5 Notes—Trig Functions of any Angle**

🙨 In Trigonometry we look at an angle in terms of a rotating ray. The beginning position of

the ray is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ side of the angle.

🙨 The ray is rotated about its end point called the \_\_\_\_\_\_\_\_\_\_\_\_\_ and the final position of the

ray is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ side of the angle.

🙨 The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of an angle is a number that describes the amount of rotation from the initial side to the terminal side of the angle.

Positive angles are generated by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rotations

Negative angles are generated by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rotations

**\*\*\*NOTE**: Typically angles are drawn in STANDARD POSITION with vertex at the origin & initial side on the positive x-axis.

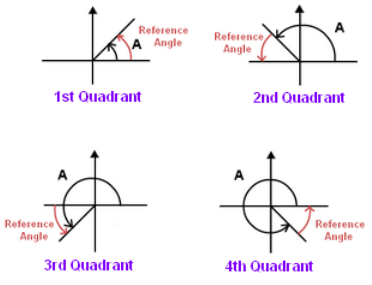
🙨 Because it is possible for two angles to have the same initial side and terminal side but different angle measures we refer to these angles as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ angles.

**Ex 1)** Find 2 positive and 2 negative angles that are co-terminal with the given angle.

**a)** 30° **b)** –150° **c)** 

**d)** 300° e**)** –210° f**)** 

**reference angle** -- the angle that the given angle makes with the x-axis. Regardless of where the angle ends (that is, regardless of the location of the terminal side of the angle), the reference angle measures the closest distance of that terminal side to the x-axis.



**Ex 2)** Draw each angle in standard position, and find its reference angle.

|  |  |  |
| --- | --- | --- |
|  = 60° |  = 135° |  = 315° |
|  = -30° |  = 585° |  = -342° |

**Ex 3)** Let θ be the acute angle in standard **Ex 4)** Find the six trig functions of an angle

position whose terminal side contains whose terminal side passes through (-6, 8)

(5, 3). Find the 6 trig functions of θ.

**Ex 5)** Find the six trig functions of 315° **Ex 6)** Find each of the following:

**a)**  sin(-210°)

**b)** tan(5π/3)

**c)** sec (-3π/4)

🙨Angles whose terminal sides lie along one of the coordinate axes are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_ angles.

**Ex 7)** Find each of the following, if it exists:

**a)**  sin(-270°) **b)** tan 3π **c)** sec (11π/2)

**d)**  cos(180°) **e)** cot (0) **f)** csc (–π/2)

**Ex 8)** Find cosθ and tanθ using the given information to construct a reference angle.

**a)** sinθ = 3/7 **b)** secθ = 3 **c)** cot is undefined

tanθ < 0 sinθ > 0 sec < 0

**Ex 9)** Find sinθ and cotθ using the given information to construct a reference angle.

**d)** cosθ = –12/13 **e)** cscθ = –5 **e)** tan is undefined

sinθ < 0 tanθ < 0 sin > 0