

Functions of General Angles:

Acute angles in standard position are all in the first quadrant, and all of their trigonometric functions exist and are positive in value. This is not necessarily true of angles in general. Some of the six trigonometric functions of quadrantal angles are undefined, and some of the six trigonometric functions have negative values, depending on the size of the angle. Angles in standard position have their terminal side in or between one of the four quadrants. Figure shows a point A (x, y) located on the terminal side of angle θ with r as the distance AO. Note that r is always positive.

Based on the figures,

$$\sin \theta = \frac{y}{r}$$

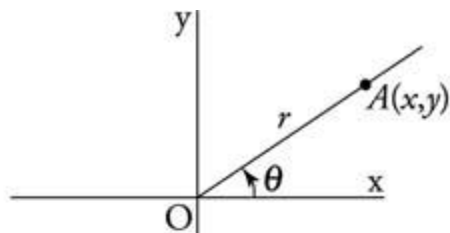
$$\csc \theta = \frac{r}{y}; y \neq 0$$

$$\cos \theta = \frac{x}{r}$$

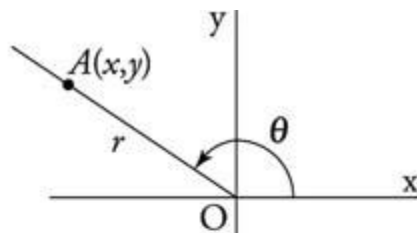
$$\sec \theta = \frac{r}{x}; x \neq 0$$

$$\tan \theta = \frac{y}{x}; x \neq 0$$

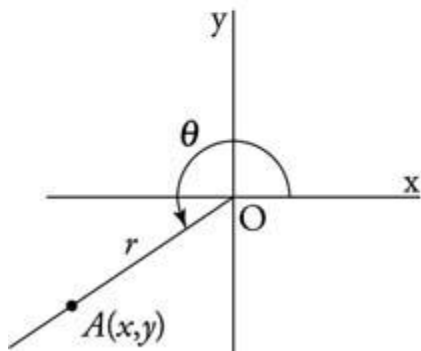
$$\cot \theta = \frac{x}{y}; y \neq 0$$



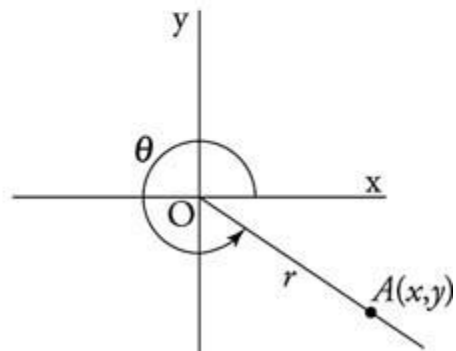
(a)



(b)



(c)



(d)