

$$16. \begin{pmatrix} \frac{1}{5} & -\frac{2}{3} \\ x & y \end{pmatrix}$$

1st

$$r = \sqrt{x^2 + y^2}$$

$$= \sqrt{\left(\frac{1}{5}\right)^2 + \left(-\frac{2}{3}\right)^2}$$

$$= \sqrt{\frac{1}{25} + \frac{4}{9}}$$

$$= \sqrt{\frac{9}{225} + \frac{100}{225}}$$

$$\frac{\sqrt{109}}{225}$$

$$\frac{\sqrt{109}}{\sqrt{5 \cdot 5 \cdot 3 \cdot 3}}$$

$$\frac{\sqrt{109}}{15}$$

$$\frac{15}{15}$$

$$\frac{15}{15}$$

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

$$= \frac{1}{5}$$

$$\frac{\sqrt{109}}{15}$$

$$= \frac{1}{5} \cdot \frac{15}{\sqrt{109}}$$

$$= \frac{3}{\sqrt{109}} \leftarrow$$

$$= \frac{3\sqrt{109}}{109}$$

$$\sec \theta = \frac{\sqrt{109}}{3}$$

$$\sin \theta = \frac{y}{r} = \frac{-\frac{2}{3}}{\frac{\sqrt{109}}{15}}$$

$$= -\frac{2}{3} \cdot \frac{15}{\sqrt{109}}$$

$$= \frac{-10}{\sqrt{109}} \leftarrow$$

$$= \frac{-10\sqrt{109}}{109}$$

$$\csc \theta = \frac{\sqrt{109}}{-10}$$

$$\tan \theta = \frac{y}{x}$$

$$= \frac{-\frac{2}{3}}{\frac{1}{5}}$$

$$= -\frac{2}{3} \cdot \frac{5}{1}$$

$$= -\frac{10}{3}$$

$$\cot \theta = \frac{3}{-10}$$