

6. $9x^2 - 6xy + y^2 - 10\sqrt{10}x - 30\sqrt{10}y = 0$

① $A=9 \quad B=-6 \quad C=1$

$\cot(\frac{\alpha}{2}) = \frac{A-C}{B}$

$\cot(\frac{\alpha}{2}) = \frac{9-1}{-6}$

$\cot(\frac{\alpha}{2}) = \frac{8}{-6}$

$\cot(\frac{\alpha}{2}) = \frac{-4}{3}$



$\frac{1}{\tan(\frac{\alpha}{2})} = \frac{-4}{3}$

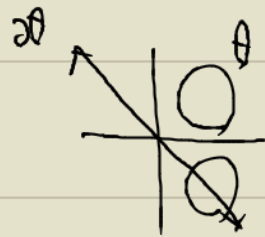
$\tan(\frac{\alpha}{2}) = \frac{3}{-4}$

$\frac{\alpha}{2} = \tan^{-1}\left(\frac{-3}{4}\right)$

$\frac{\alpha}{2} = -36.87^\circ + 180^\circ$

$\frac{\alpha}{2} = 143.13^\circ$

$\alpha = 72^\circ$



SINCE NOT ON UNIT CIRCLE

$\cot(\frac{\alpha}{2}) = \frac{-4}{3} \sim \frac{x}{y}$

FIND r

$r^2 = x^2 + y^2$

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

$r = \sqrt{(-4)^2 + 3^2}$

$r = \sqrt{16+9}$

$r = \sqrt{25}$

$r = 5$

$\cos(\frac{\alpha}{2}) = \frac{x}{r}$

$\cos(\frac{\alpha}{2}) = \frac{-4}{5}$

1ST $\cos \theta = \sqrt{\frac{1 + \cos(\frac{\alpha}{2})}{2}}$

$\cos \theta = \sqrt{\frac{1 - \frac{4}{5}}{2}}$

$\cos \theta = \sqrt{\frac{5-4}{10}}$

$\cos \theta = \sqrt{\frac{1}{10}}$

$\cos \theta = \frac{\sqrt{1}}{\sqrt{10}}$

$\cos \theta = \frac{\sqrt{10}}{10}$

2ND

$\sin \theta = \sqrt{\frac{1 - \cos(\frac{\alpha}{2})}{2}}$

$= \sqrt{\frac{1 - (-\frac{4}{5})}{2}}$

$= \sqrt{\frac{1 + \frac{4}{5}}{2}}$

$= \sqrt{\frac{5+4}{10}}$

$= \sqrt{\frac{9}{10}}$

$= \frac{\sqrt{9}}{\sqrt{10}} = \frac{3}{\sqrt{10}} = \frac{3\sqrt{10}}{10}$