Math 49B (9:30am – 10:20am)
Group Quiz 3
Fri Oct 17, 2008

Group Members' Names: _____

SCORE: ___ / 10 POINTS

NO CALCULATORS ALLOWED

Find the trigonometric form of $-5+5\sqrt{3}i$.

SCORE: ___ / 3 POINTS

$r = \sqrt{(-5)^2+(5\sqrt{3})^2}$

$r = \sqrt{25+75}$

$r = 10$ 1

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

$\theta = \tan^{-1}(-\sqrt{3})+\pi$

$\theta = -\frac{\pi}{3}+\pi$

$\theta = \frac{2\pi}{3}$ 1

$10\,cis\,\frac{2\pi}{3}$ 1

Find the standard form of $10\,cis\,\frac{7\pi}{4}$.

SCORE: ___ / 2 POINTS

$10\left(\cos\frac{7\pi}{4}+i\sin\frac{7\pi}{4}\right) = 10\left(\frac{\sqrt{2}}{2}-\frac{\sqrt{2}}{2}i\right) = 5\sqrt{2}-5\sqrt{2}i$ ½ 1 ½

Use DeMoivre's Theorem and write in standard form for $(-1+i)^5$.

SCORE: ___ / 5 POINTS

$r = \sqrt{(-1)^2+1^2}$

$r = \sqrt{2}$ 1

$\theta = \tan^{-1}\left(\frac{1}{-1}\right)+\pi$

$\theta = \tan^{-1}(-1)+\pi$

$\theta = -\frac{\pi}{4}+\pi$

$\theta = \frac{3\pi}{4}$ 1

$\left(\sqrt{2}\,cis\,\frac{3\pi}{4}\right)^5$

$= \sqrt{2}^5\,cis\,\frac{15\pi}{4}$ 1

$= 4\sqrt{2}\left(\cos\frac{15\pi}{4}+i\sin\frac{15\pi}{4}\right)$ ½

$= 4\sqrt{2}\left(\frac{\sqrt{2}}{2}-\frac{\sqrt{2}}{2}i\right)$ ½

$= 4-4i$ 1