

SCORE: ____ / 10 POINTS

NO CALCULATORS ALLOWED

Find the trigonometric form of $-6\sqrt{3} - 6i$.

SCORE: ____ / 3 POINTS

$$r = \sqrt{(-6\sqrt{3})^2 + (-6)^2}$$

$$r = \sqrt{108 + 36}$$

$$r = 12$$

$$\theta = \tan^{-1}\left(\frac{-6}{-6\sqrt{3}}\right) + \pi$$

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

$$\theta = \frac{\pi}{6} + \pi$$

$$\theta = \frac{7\pi}{6}$$

$$12 \operatorname{cis} \frac{7\pi}{6}$$

Find the standard form of $8 \operatorname{cis} \frac{3\pi}{4}$.

SCORE: ____ / 2 POINTS

$$8 \left(\cos \frac{3\pi}{4} + i \sin \frac{3\pi}{4} \right) = 8 \left(-\frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2}i \right) = -4\sqrt{2} + 4\sqrt{2}i$$

Use DeMoivre's Theorem and write in standard form for $(\sqrt{3} - i)^7$.

SCORE: ____ / 5 POINTS

$$r = \sqrt{(\sqrt{3})^2 + (-1)^2}$$

$$r = 2$$

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

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

$$\theta = -\frac{\pi}{6}$$

$$(2 \operatorname{cis}(-\frac{\pi}{6}))^7$$

$$= 2^7 \operatorname{cis}(-\frac{7\pi}{6})$$

$$= 128 (\cos(-\frac{7\pi}{6}) + i \sin(-\frac{7\pi}{6}))$$

$$= 128 \left(-\frac{\sqrt{3}}{2} + \frac{1}{2}i \right)$$

$$= -64\sqrt{3} + 64i$$