Honors Trigonometry

Copy original problem.

Convince *me* that **you** understand the concept!

You may use a calculator in section V *only*.

Name ______________________

Per ________ Date ________

Chapter 7 Exam

I Given z_1 and z_2 find: $z_1 + z_2$, $z_1 \cdot z_2$, and $\frac{z_1}{z_2}$.

Write your answers in cartesian coordinate form [ie. (a,b)] where a and b are real numbers.

(3 pts ea part; total 36 pts)

A) $z_1 = 5+3i$, $z_2 = 3+2i$

B) $z_1 = 4+\sqrt{-4}$, $z_2 = 5-\sqrt{-36}$

C) $z_1 = (6,-2)$, $z_2 = (3,4)$

D) $z_1 = 2\operatorname{cis}30°$, $z_2 = 3\operatorname{cis}60°$

II Given z_1 and z_2 find: $z_1 \cdot z_2$, and $\frac{z_1}{z_2}$.. (tot 24 pts)

Write your final answer in the form of: $\rho \operatorname{cis}\theta$; $(0 \le \theta < 360\ ;\ \rho \ge 0)$

A) $z_1 = -1+i$, $z_2 = -2+2i$

B) $z_1 = 4-4i$, $z_2 = -2i$

C) $z_1 = 5\sqrt{2}\ \operatorname{cis}\ 45°$, $z_2 = 5(1+i)$

D) $z_1 = 4\operatorname{cis}270°$, $z_2 = 4\operatorname{cis}90°$

III Express: $\left(\frac{3\sqrt{3}}{2} + \frac{3i}{2}\right)^{-6}$ in the form of a + bi (10 pts)

IV Find the four fourth roots of i. Write your answers in $\rho \operatorname{cis}\theta$; $(0 \le \theta < 360\ ;\ \rho \ge 0)$ (10 pts)

V Sketch the following equations on the axes provided on the opposite side of this paper. (5 pts ea)

Mark 2 points (which are **not on any axis**) for *each* equation and give the coordinate in both cartesian and polar form.

A) $\rho = 3(1+\cos\theta)$

B) $\rho = 4\sin\theta$

C) $\rho = \frac{2}{\cos\theta}$

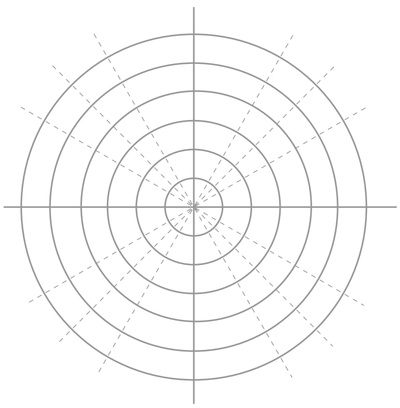
D) $\sin\theta = \frac{3}{\rho}$

Extra Credit ••••••••••••••••••••••••••••••••••••• 5 pts •••

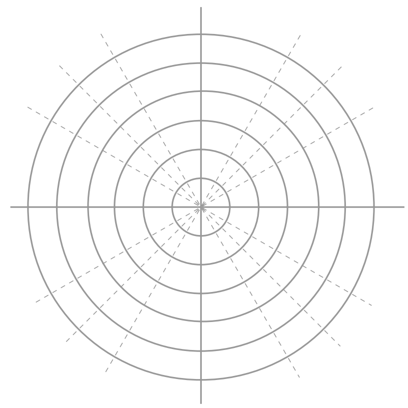
Compute the number of degrees in the smallest positive angle θ such that:

$$8\sin\theta\cos^5\theta - 8\sin^5\theta\cos\theta = 1$$

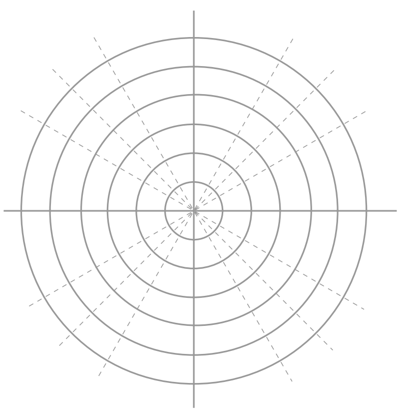
V **A)**



V **B)**



V **C)**



V **D)**