Honors Trigonometry

Copy original problem.

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

No calculators.

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) $z_1 = 2 + 3i$, $z_2 = -4 + 3i$

B) $z_1 = 5 - \sqrt{-16}$, $z_2 = 4 + \sqrt{-36}$

C) $z_1 = (4, -5)$, $z_2 = (3, -2)$

D) $z_1 = 3\,\text{cis}\,150°$, $z_2 = -2\,\text{cis}(-60°)$

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: $\rho\,\text{cis}\,\theta$; $(0 \le \theta < 360\ ;\ \rho \ge 0\ )$

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

B) $z_1 = (-2, 2)$, $z_2 = (\sqrt{3}, -1)$

C) $z_1 = 3\ \text{cis}\ -240°$, $z_2 = \left(\frac{5}{\sqrt{2}}, \frac{-5}{\sqrt{2}}\right)$

D) $z_1 = 3\sqrt{2}\,\text{cis}\,210°$, $z_2 = 2\sqrt{3}\,\text{cis}\,120°$

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

IV Fill in the supplied tables (on back of this paper). Plot *all* the points. Sketch the curve on the supplied axis. Rewrite the curve in cartesian format. (hint: $\sqrt{2} \approx 1.4$ and $\sqrt{3} \approx 1.6$) (15 pts ea)

A) $\rho = 3\cos\theta$

B) $\rho = 2(1 - \sin\theta)$

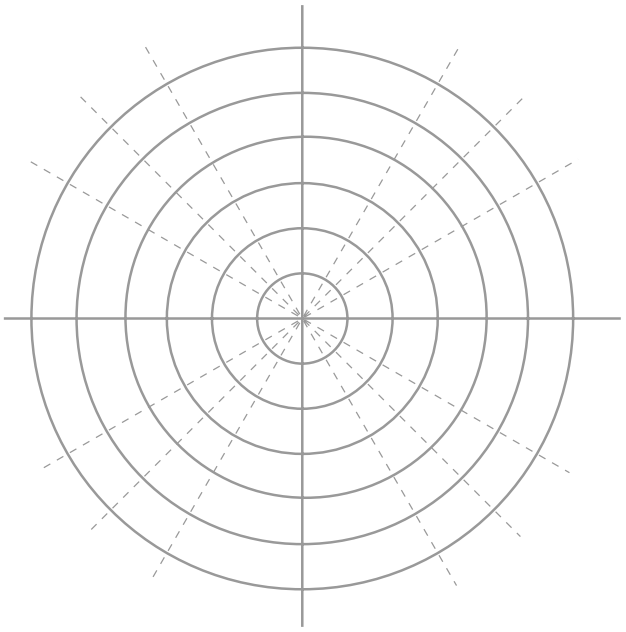
Extra Credit •••••••••••••••••••••••••••••••••••• **5 pts** ••

Let z_1 and z_2 be the roots of $ax^2 + bx + c = 0;\ a \neq 0$.

Show that $z_1 + z_2 = -\frac{b}{a}$ and $z_1 z_2 = \frac{c}{a}$.

IV A) $\rho = 3\cos\theta$

ρ	θ
	0
	30
	60
	90
	120
	150
	180
	210
	240
	270
	300
	330



IV C) $\rho = 2(1 - \sin\theta)$

ρ	θ
	0
	30
	60
	90
	120
	150
	180
	210
	240
	270
	300
	330