Chapter 11 Review B Name ____________________ Assignment # _____

Find $z_1 \cdot z_2$ and $\frac{z_1}{z_2}$ in rectangular form

1. $z_1 = 3cis\frac{\pi}{2}; z_2 = cis\left(\frac{-\pi}{2}\right)$

2. $z_1 = 2cis135^\circ; z_2 = \frac{2}{3}cis90^\circ$

Use De Moivre's Theorem to evaluate each expression. Express your answers in rectangular form.

3. $\left(-1+\sqrt{3}i\right)^{-5}$

4. $\left(-\sqrt{3}-i\right)^{3}$

5. $\left(-i\right)^{-5}$

6. $\left(2-2\sqrt{3}i\right)^{2}$

Express each complex number in rectangular form

7. $2\left(\cos\frac{\pi}{2}+i\sin\frac{\pi}{2}\right)$

8. $3cis\frac{5\pi}{4}$

Graph each number on the complex plane. Find the polar form of each number.

9. $-2-3i$

10. $\frac{1}{2}-\frac{\sqrt{3}}{2}i$

Find 4 polar coordinates for each point (2 pos and 2 neg r)

11. $(-1,1)$

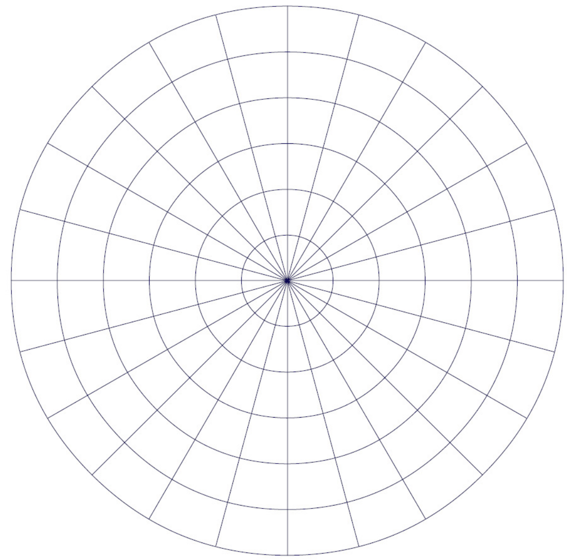
12. $\left(-1,-\sqrt{3}\right)$

Find the rectangular coordinates for each point.

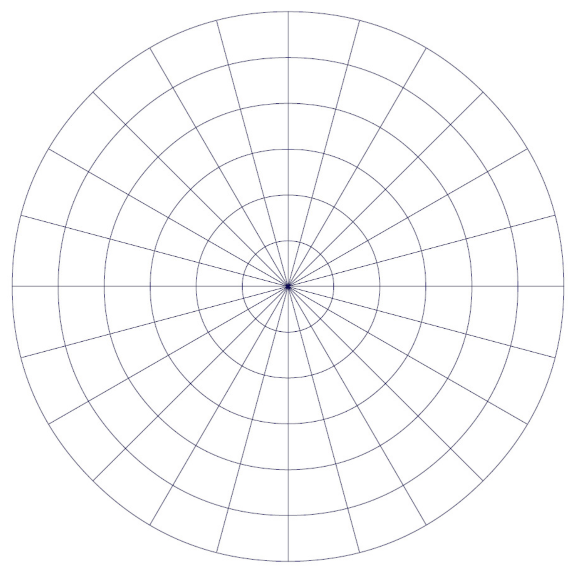
13. $\left(1, \frac{7\pi}{6}\right)$

14. $\left(-3, \frac{5\pi}{6}\right)$

15. Graph r = $\cos\theta - 1$ (cardioid)



16. Graph $r = 2 - 3\sin\theta$ (limacon)



17. Find the cube roots of 8.

18. Find the cube roots of -8i.

Answers:

1. 3

1b. -3

2a. $\frac{-2\sqrt{2}}{3}-\frac{2\sqrt{2}}{3}i$

2b. $\frac{3\sqrt{2}}{2}+\frac{3\sqrt{2}}{2}i$

3. $\frac{-1}{64}+\frac{\sqrt{3}}{64}i$

4. -8i

5. 0 + 1i

6. $-8-8\sqrt{3}i$

7. 2i

8. $\frac{-3\sqrt{2}}{2}-\frac{3\sqrt{2}}{2}i$

9. $\sqrt{13}cis236.3^{\circ}$

10. 1 cis 300°

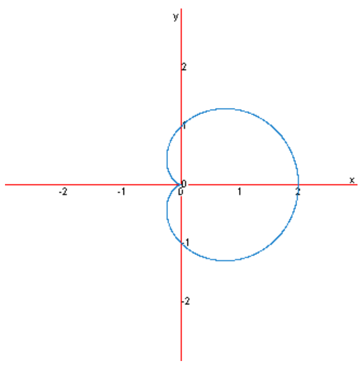
11. $\left(\sqrt{2},135^{\circ}\right);\left(\sqrt{2},-225^{\circ}\right);\left(-\sqrt{2},315^{\circ}\right);\left(-\sqrt{2},-45^{\circ}\right)$

12. (2, 240°); (2, -120°); (-2, 60°); (-2, -300°)

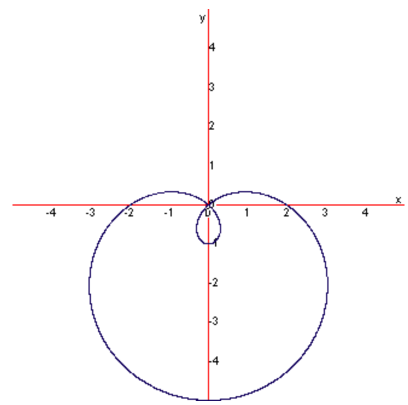
13. $\left(\frac{-\sqrt{3}}{2},-\frac{1}{2}\right)$

14. $\left(\frac{3\sqrt{3}}{2},\frac{-3}{2}\right)$

15.



16.



17. $2;-1+\sqrt{3}i;-1-\sqrt{3}i$

18. $2i;-\sqrt{3}-i;\sqrt{3}-i$