

YOU MUST DO YOUR WORK ON A SEPARATE PIECE OF PAPER FOR ALL EXCEPT #13.

Write in polar form (  $\theta$  to the nearest tenth)

1.  $-2+8i$

2.  $-5i$  (use radians)

Write in rectangular form.

3.  $18cis330^\circ$

Write in rectangular form.

4.  $18cis201^\circ$  (nearest tenth)

#5 and 6. Answer in both polar and rectangular form.

5.  $z_1 = 9cis60^\circ$  and  $z_2 = 8cis90^\circ$

a) Find  $z_1 \cdot z_2$

b)  $z_1^3$

c)  $\frac{z_1}{z_2}$

6. Given  $z = 2cis\frac{5\pi}{6}$ . Find  $z^{-3}$

7. Find  $\left(\frac{\sqrt{3}}{2} - \frac{1}{2}i\right)^{10}$

8) Find  $(-2+3i)^6$  in rectangular form. (keep precise answers on calc.)

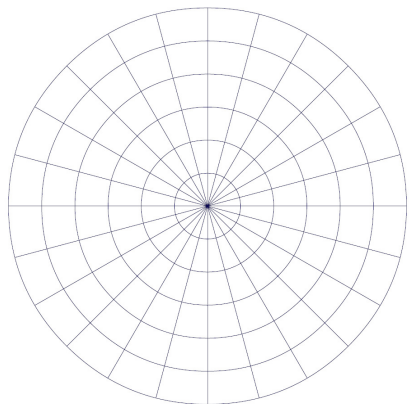
9. Find the cube roots of  $8i$ . Express answers in rectangular form

10. Find the square roots of  $-\sqrt{2} + i\sqrt{2}$ . Express answers in rectangular form.

11. Change  $(-5, -8)$  to polar coordinates. (nearest tenth)

12) Change  $\left(18, \frac{2\pi}{3}\right)$  to rectangular coordinates.

13. Make a table of values and graph  $r = 1 + 3\sin\theta$  (limaçon)



Answers

1.  $(2\sqrt{17} \text{cis} 104.0^\circ)$       2.  $5 \text{cis} \frac{3\pi}{2}$       3.  $9\sqrt{3} - 9i$       4.  $-16.8 - 6.5i$

5a.  $72 \text{cis} 150^\circ = -36\sqrt{3} + 36i$       5b.  $729 \text{cis} 180^\circ = -729 + 0i$       5c.  $\frac{9}{8} \text{cis} 330^\circ = \frac{9\sqrt{3}}{16} - \frac{9}{16}i$

6a.  $\frac{1}{8} \text{cis} \frac{3\pi}{2} = 0 - \frac{1}{8}i$       7.  $\frac{1}{2} + \frac{\sqrt{3}}{2}i$       8.  $2035 + 828i$

9.  $2 \text{cis} 30^\circ = \sqrt{3} + i$  ;       $2 \text{cis} 150^\circ = -\sqrt{3} + i$  ;       $2 \text{cis} 270^\circ = 0 - 2i$

10.  $-0.54 + 1.31i$ ;  $-0.54 - 1.31i$       11.  $(\sqrt{89}, 238.0^\circ)$       12.  $(-9, 9\sqrt{3})$

13.

