

## Assignment- Complex Number (Polar Form power and root) Date \_\_\_\_\_

**Simplify. Write your answer in polar form.**

1)  $\left(2\left(\cos \frac{2\pi}{3} + i\sin \frac{2\pi}{3}\right)\right)^2$

2)  $\left(6\left(\cos \frac{2\pi}{3} + i\sin \frac{2\pi}{3}\right)\right)^2$

3)  $\left(\sqrt{11}\left(\cos \frac{2\pi}{3} + i\sin \frac{2\pi}{3}\right)\right)^2$

4)  $\left(\sqrt{26}\left(\cos \frac{\pi}{3} + i\sin \frac{\pi}{3}\right)\right)^2$

**Find all  $n$ th roots. Write your answers in polar form.**

5)  $3\left(\cos \frac{2\pi}{3} + i\sin \frac{2\pi}{3}\right), n = 3$

6)  $4\left(\cos \frac{5\pi}{3} + i\sin \frac{5\pi}{3}\right), n = 2$

$$7) 2\left(\cos \frac{5\pi}{3} + i\sin \frac{5\pi}{3}\right), n = 4$$

$$8) \sqrt{15}\left(\cos \frac{2\pi}{3} + i\sin \frac{2\pi}{3}\right), n = 2$$

**Find the absolute value.**

$$9) 5\left(\cos \frac{\pi}{3} + i\sin \frac{\pi}{3}\right)$$

$$10) \sqrt{21}\left(\cos \frac{\pi}{3} + i\sin \frac{\pi}{3}\right)$$

$$11) 3 + 4i$$

$$12) \frac{5\sqrt{3}}{2} - \frac{5}{2}i$$

## Answers to Assignment- Complex Number (Polar Form power and root)

- 1)  $4\left(\cos \frac{4\pi}{3} + i\sin \frac{4\pi}{3}\right)$       2)  $36\left(\cos \frac{4\pi}{3} + i\sin \frac{4\pi}{3}\right)$       3)  $11\left(\cos \frac{4\pi}{3} + i\sin \frac{4\pi}{3}\right)$
- 4)  $26\left(\cos \frac{2\pi}{3} + i\sin \frac{2\pi}{3}\right)$       5)  $\sqrt[3]{3}\left(\cos \frac{2\pi}{9} + i\sin \frac{2\pi}{9}\right)$       6)  $2\left(\cos \frac{5\pi}{6} + i\sin \frac{5\pi}{6}\right)$   
 $\sqrt[3]{3}\left(\cos \frac{8\pi}{9} + i\sin \frac{8\pi}{9}\right)$        $2\left(\cos \frac{11\pi}{6} + i\sin \frac{11\pi}{6}\right)$   
 $\sqrt[3]{3}\left(\cos \frac{14\pi}{9} + i\sin \frac{14\pi}{9}\right)$
- 7)  $\sqrt[4]{2}\left(\cos \frac{5\pi}{12} + i\sin \frac{5\pi}{12}\right)$       8)  $\sqrt[4]{15}\left(\cos \frac{\pi}{3} + i\sin \frac{\pi}{3}\right)$       9) 5  
 $\sqrt[4]{2}\left(\cos \frac{11\pi}{12} + i\sin \frac{11\pi}{12}\right)$        $\sqrt[4]{15}\left(\cos \frac{4\pi}{3} + i\sin \frac{4\pi}{3}\right)$   
 $\sqrt[4]{2}\left(\cos \frac{17\pi}{12} + i\sin \frac{17\pi}{12}\right)$   
 $\sqrt[4]{2}\left(\cos \frac{23\pi}{12} + i\sin \frac{23\pi}{12}\right)$
- 10)  $\sqrt{21}$       11) 5      12) 5