

Aim: How do we multiply and divide complex numbers in trigonometric form?**I. Do Now:**

1. Multiply

$$(-1+i\sqrt{3})(4\sqrt{3}-4i)$$

2. Convert to trigonometric form:

(a) $-1+i\sqrt{3}$

(b) $4\sqrt{3}-4i$

II. Multiplication of Complex Numbers in Trigonometric FormIf $z_1 = r_1(\cos\theta_1 + i\sin\theta_1)$ and $z_2 = r_2(\cos\theta_2 + i\sin\theta_2)$ then,

$z_1 z_2 =$

III. Division of Complex Numbers in Trigonometric FormIf $z_1 = r_1(\cos\theta_1 + i\sin\theta_1)$ and $z_2 = r_2(\cos\theta_2 + i\sin\theta_2)$ then,

$\frac{z_1}{z_2} =$

IV. Applications

3. $2(\cos 120^\circ + i\sin 120^\circ) \times 8(\cos 330^\circ + i\sin 330^\circ)$

4. $6(\cos \frac{\pi}{2} + i\sin \frac{\pi}{2}) \times 4(\cos 0 + i\sin 0)$

5. $12(\text{cis } 135^\circ) \div 4(\text{cis } 45^\circ)$

6. $2(\cos 120^\circ + i\sin 120^\circ) \times 2(\cos 120^\circ + i\sin 120^\circ)$

7. $24(\cos 300^\circ + i\sin 300^\circ) \div 8(\cos 75^\circ + i\sin 75^\circ)$

*8. If $z = 2(\cos 120^\circ + i\sin 120^\circ)$, find z^3 .

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• Read pages 446 – 447.

• p. 452: 12, 24, 28, 36, 37, 47, 49, 51, 66, 68, 76, 77