

1. Multiplying in Trigonometric form: $r_1 \operatorname{cis} \theta_1 * r_2 \operatorname{cis} \theta_2 = r_1 r_2 \operatorname{cis}(\theta_1 + \theta_2)$
2. Dividing in Trigonometric form: $\frac{r_1 \operatorname{cis} \theta_1}{r_2 \operatorname{cis} \theta_2} = \frac{r_1}{r_2} \operatorname{cis}(\theta_1 - \theta_2)$
3. $3 \operatorname{cis} 23^\circ * 12 \operatorname{cis} 49^\circ = \boxed{36 \operatorname{cis} 72^\circ}$ Multiply absolute values and Add the angles
4. $\frac{55 \operatorname{cis} \frac{\pi}{2}}{5 \operatorname{cis} \frac{\pi}{6}} = \boxed{11 \operatorname{cis} \frac{\pi}{3}}$ Divide the absolute values and Subtract the angles
5. $\frac{2+5i}{9-3i} = \frac{2+5i}{9-3i} \cdot \frac{9+3i}{9+3i} = \frac{18+51i-15}{81+9} = \frac{3-51i}{90} = \boxed{\frac{1}{30} - \frac{17}{30}i}$
6. $\frac{4-2i}{7i} = \frac{4-2i}{7i} \cdot \frac{-7i}{-7i} = \frac{-28i-14}{49} = \boxed{-\frac{2}{7} - \frac{4}{7}i}$

Perform the operation and leave the result in trigonometric form where $0^\circ \leq \theta < 360^\circ$.

1. $3 \operatorname{cis} \frac{\pi}{3} * 4 \operatorname{cis} \frac{\pi}{6}$

2. $\frac{3}{2} \operatorname{cis} \frac{\pi}{6} * 6 \operatorname{cis} \frac{\pi}{4}$

3. $\frac{5}{3} \operatorname{cis} 140^\circ * \frac{2}{3} \operatorname{cis} 60^\circ$

4. $\frac{1}{2} \operatorname{cis} 115^\circ * \frac{4}{5} \operatorname{cis} 300^\circ$

5. $\frac{11}{20} \operatorname{cis} 290^\circ * \frac{2}{5} \operatorname{cis} 200^\circ$

6. $\operatorname{cis} 5^\circ * \operatorname{cis} 20^\circ$

7. $\frac{\operatorname{cis} 50^\circ}{\operatorname{cis} 20^\circ}$

8. $\frac{5 \operatorname{cis} 4.3}{4 \operatorname{cis} 2.1}$

9. $\frac{\operatorname{cis} \frac{7\pi}{4}}{\operatorname{cis} \pi}$

$$10. \frac{\text{cis } 54^\circ}{\text{cis } 102^\circ}$$

$$11. \frac{9 \text{ cis } 20^\circ}{5 \text{ cis } 75^\circ}$$

Perform the operation and leave the result in standard form.

$$12. \frac{3 + 3i}{1 - \sqrt{3}i}$$

$$13. \frac{4i}{-1 + i}$$