

1) Let $z_1 = 1 + 2i$ and $z_2 = 3 - i$. Evaluate $z_1 \bar{z}_2$.

$$z_1 \bar{z}_2 = (1 + 2i)\overline{(3 - i)} = (1 + 2i)(3 + i) = 3 - 2 + 6i + i = 1 + 7i$$

2) Find all of the 5th roots of unity.

$$1, e^{\frac{2\pi i}{5}}, e^{\frac{4\pi i}{5}}, e^{\frac{6\pi i}{5}}, e^{\frac{8\pi i}{5}}$$

3) Write $\frac{1}{2} + \frac{\sqrt{3}}{2}i$ in trigonometric form.

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

