1. The unit vector v in the direction of $\langle -8, -15 \rangle$ is:

2. Find the component form of the vector originating from (3,-1) with terminal point (-5, 6).
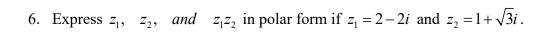
3. Give the rectangular **coordinates** for each point:

   a. $(2\sqrt{2}, \frac{\pi}{4})$ b. $(-2, -30^o)$

4. Give the polar **coordinates**, with $r > 0$ and $0 \le \theta < 2\pi$, for each of the following:

   a. $(2, 0)$ b. $(-1, -\sqrt{3})$

5. Plot the point with polar coordinate $(4, \frac{5\pi}{3})$. Then find two other sets of polar coordinates for this point: one set with r < 0 and the other with $\theta < 0$.

6. Express z_1, z_2, and $z_1 z_2$ in polar form if $z_1 = 2 - 2i$ and $z_2 = 1 + \sqrt{3}i$.

7. Let $z = 3cis\,120^o$. Find z^2 in polar form and in rectangular form.

8. Find $(1 + i\sqrt{3})^3$ using De Moivre's Theorem

9. Sketch the polar graph of $r = 2\sin\theta$. Include arrows indicating which way the curve is drawn.

CALCULATOR PART

10. Determine the magnitude of the vector with initial point (-3, 8) and terminal point (5, -2).

11. A vector v has magnitude 5 and direction $\theta = \dfrac{3\pi}{4}$. Find v.

12. A plane is on a bearing of 55° at a speed of 500 mph. If there is a 35 mph wind at a bearing of 65°, what s the resultant bearing and speed of the plane?

13. Let $\mathbf{u} = \langle 1,1 \rangle$. Find the vector $\mathbf{v}$ such that $u \cdot v = 8$ and $| v | = \sqrt{32}$.

14. Determine the parameterization of the line segment with end points A = (2, -3) and B = (1, 2).