Problems

1. Find the vector of magnitude 5 units in the direction of \( \mathbf{A} = 2\mathbf{i} + 3\mathbf{j} \).

2. The vector \( \mathbf{A} = 3\mathbf{i} - 4\mathbf{j} \) is multiplied by a scalar 2. Find the magnitude of the resulting vector.

3. If \( \mathbf{A} = 5\mathbf{i} + 7\mathbf{j} \) and \( \mathbf{B} = -2\mathbf{i} + 3\mathbf{j} \), find the dot product of \( \mathbf{A} \) and \( \mathbf{B} \).

4. The vector \( \mathbf{A} = 4\mathbf{i} - 5\mathbf{j} \) is rotated 90° counterclockwise about the origin. Find the new vector.

5. The vector \( \mathbf{A} = 6\mathbf{i} + 8\mathbf{j} \) is rotated 180°. Find the new vector.

6. The vector \( \mathbf{A} = 7\mathbf{i} - 9\mathbf{j} \) is rotated 270° clockwise about the origin. Find the new vector.

7. The vector \( \mathbf{A} = 10\mathbf{i} + 12\mathbf{j} \) is rotated 360°. Find the original vector.

8. The vector \( \mathbf{A} = 13\mathbf{i} - 15\mathbf{j} \) is rotated 45° clockwise about the origin. Find the new vector.

9. The vector \( \mathbf{A} = 16\mathbf{i} + 18\mathbf{j} \) is rotated 225° counterclockwise about the origin. Find the new vector.