

8-2 Practice**Vectors in the Coordinate Plane**

Find the component form and magnitude of \overline{AB} with the given initial and terminal points.

1. $A(2, 4), B(-1, 3)$

$\langle -3, -1 \rangle; \sqrt{10}$

2. $A(4, -2), B(5, -5)$

$\langle 1, -3 \rangle; \sqrt{10}$

3. $A(-3, -6), B(8, -1)$

$\langle 11, 5 \rangle; \sqrt{146}$

Find each of the following for $\mathbf{v} = \langle 2, -1 \rangle$ and $\mathbf{w} = \langle -3, 5 \rangle$.

4. $3\mathbf{v}$

$\langle 6, -3 \rangle$

5. $\mathbf{w} - 2\mathbf{v}$

$\langle -7, 7 \rangle$

6. $4\mathbf{v} + 3\mathbf{w}$

$\langle -1, 11 \rangle$

7. $5\mathbf{w} - 3\mathbf{v}$

$\langle -21, 28 \rangle$

Find a unit vector \mathbf{u} with the same direction as \mathbf{v} .

8. $\mathbf{v} = \langle -3, 6 \rangle \left\langle -\frac{\sqrt{5}}{5}, \frac{2\sqrt{5}}{5} \right\rangle$

9. $\mathbf{v} = \langle -8, -2 \rangle \left\langle -\frac{4\sqrt{17}}{17}, -\frac{\sqrt{17}}{17} \right\rangle$

Let \overline{DE} be the vector with the given initial and terminal points. Write \overline{DE} as a linear combination of the vectors \mathbf{i} and \mathbf{j} .

10. $D(4, -5), E(6, -7) \quad 2\mathbf{i} - 2\mathbf{j}$

11. $D(-4, 3), E(5, -2) \quad 9\mathbf{i} - 5\mathbf{j}$

12. $D(4, 6), E(-5, -2) \quad -9\mathbf{i} - 8\mathbf{j}$

13. $D(2, 1), E(3, 7) \quad \mathbf{i} + 6\mathbf{j}$

Find the component form of \mathbf{v} with the given magnitude and direction angle.

14. $|\mathbf{v}| = 12, \theta = 42^\circ \quad \langle 8.9, 8.0 \rangle$

15. $|\mathbf{v}| = 8, \theta = 132^\circ \quad \langle -5.4, 5.9 \rangle$

16. GARDENING Anne and Henry are lifting a stone statue and moving it to a new location in their garden. Anne is pushing the statue with a force of 120 newtons at a 60° angle with the horizontal while Henry is pulling the statue with a force of 180 newtons at a 40° angle with the horizontal.

What is the magnitude of the combined force they exert on the statue?

295.62 N