

1. Write the component form of the vector \overline{PQ} where $P = (-5, -8)$ and $Q = (12, 9)$?

2. Write \overline{PQ} as a linear combination.

3. Find $||\overline{PQ}||$.

4. Find the direction angle for \overline{PQ} .

Use vectors $\mathbf{u} = \langle 5, 12 \rangle$, $\mathbf{v} = \langle -3, 8 \rangle$, $\mathbf{w} = \langle 5, 4 \rangle$, $\mathbf{f} = \langle -2, -5 \rangle$, $\mathbf{d} = \langle 4, -7 \rangle$ to answer #5-12

5. $\mathbf{v} + \mathbf{w}$

6. $(\mathbf{u} \cdot \mathbf{v})\mathbf{w}$

7. $||\mathbf{u}||$

8. $3\mathbf{f} - 2\mathbf{d}$

9. The unit vector in the same direction as \mathbf{v} .

10. The direction angle for \mathbf{f} .

11. $\mathbf{f} \cdot \mathbf{d}$

12. The angle between \mathbf{f} and \mathbf{d} .

13. Define: **orthogonal** (be sure to discuss the dot product)

Use Points $A = (7, 2, 15)$, $B = (3, -7, -11)$, $C = (-8, 2, 4)$, $D = (-5, -5, -5)$ to answer #14-25

Determine the length of each segment.

14. \overline{AB}

15. \overline{BC}

16. \overline{CD}

17. \overline{AC}

Determine the midpoint of each segment.

18. \overline{AB}

19. \overline{BC}

20. \overline{CD}

21. \overline{AC}

Find the component form of each vector.

22. \overline{BA}

23. \overline{BC}

24. \overline{DA}

Determine the angle between the vectors.

25. \overline{BA} and \overline{BC}