

A vector v has initial point P and terminal point Q . Find its position vector.

1. $P = (1, -6)$; $Q = (4, -4)$

1. $v = -7i - 5j$

2. $u = -2i - 2j$, $v = 10i + 7j$; Find $u+v$

2. $20i - 9j$

3. If $v = 9i + 12j$, find $\|v\|$.

3. $5\sqrt{2}$

4. $v = 5i - 7j$, $w = 3i + 2j$, find $\|v\| + \|w\|$

4. $\sqrt{89}$

5. Find the unit vector having the

5. $v = \frac{5}{13}i + \frac{12}{13}j$

same direction as $v = -4i + 3j$

6. Write the vector given its magnitude and the angle it makes with the positive x-axis: $\|v\| = 9$; $\alpha = 120^\circ$

6. $v = -7\sqrt{3}i + 7j$

7. $v = -i - j$, $w = -i + j$; find $v \cdot w$

7. -171

8. Find the angle between $v = 9i + 6j$ and $w = -3i + 3j$

8. 88.2

9. Are these vectors parallel, orthogonal, or neither: $v = 2i + j$, $w = i - 2j$

9. parallel

10. Find the position vector for the vector having initial point P and Q
 $P = (-1, 1, 0)$ and $Q = (-3, 4, 3)$

10. $v = 8i - 3j - 3k$

11. $v = 2i - 6j + 4k$; find $\|v\|$

11. $2\sqrt{11}$

12. $v = -5i + 6j + 3k$ and $w = -2i + 6j + 3k$
Find $4v + 3w$

12. $4i - 14j - 19k$

13. $v = 3i + j - 3k$ and $w = i + 2j + 3k$
Find $v \cdot w$

13. 30

14. Find the angle between $v = i + j$
and $w = i + j - k$

14. 84.9