

Unit #7: Extended Trigonometry

In Problems 19–26, the vector v has initial point P and terminal point Q . Write v in the form $a\mathbf{i} + b\mathbf{j}$, that is, find its position vector:

19. $P = (0, 0)$; $Q = (3, 4)$

20. $P = (0, 0)$; $Q = (-3, -5)$

21. $P = (3, 2)$; $Q = (5, 6)$

22. $P = (-3, 2)$; $Q = (6, 5)$

23. $P = (-2, -1)$; $Q = (6, -2)$

24. $P = (-1, 4)$; $Q = (6, 2)$

25. $P = (1, 0)$; $Q = (0, 1)$

26. $P = (1, 1)$; $Q = (2, 2)$

In Problems 27–32, find $\|v\|$.

27. $v = 3\mathbf{i} - 4\mathbf{j}$

28. $v = -5\mathbf{i} + 12\mathbf{j}$

29. $v = \mathbf{i} - \mathbf{j}$

30. $v = -\mathbf{i} - \mathbf{j}$

31. $v = -2\mathbf{i} + 3\mathbf{j}$

32. $v = 6\mathbf{i} + 2\mathbf{j}$

Problems 33–38, find each quantity if $v = 3\mathbf{i} - 5\mathbf{j}$ and $w = -2\mathbf{i} + 3\mathbf{j}$.

$2v + 3w$

34. $3v - 2w$

35. $\|v - w\|$

$\|v + w\|$

37. $\|v\| - \|w\|$

38. $\|v\| + \|w\|$

Problems 39–44, find the unit vector having the same direction as v .

$v = 5\mathbf{i}$

40. $v = -3\mathbf{j}$

41. $v = 3\mathbf{i} - 4\mathbf{j}$

$v = -5\mathbf{i} + 12\mathbf{j}$

43. $v = \mathbf{i} - \mathbf{j}$

44. $v = 2\mathbf{i} - \mathbf{j}$