

Álgebra Linear e Geometria Analítica — Exercícios Seção 3.2

Questão 1 Para cada vetor a seguir, encontre um vetor unitário de mesma direção e sentido.

a) $\mathbf{v} = (4, -3)$

c) $\mathbf{v} = (2, 2, 2)$

e) $\mathbf{v} = (-2, 3, 3, -1)$

b) $\mathbf{v} = (-5, 12)$

d) $\mathbf{v} = (1, -1, 2)$

f) $\mathbf{v} = (1, 0, 2, 1, 3)$

Questão 2 Calcule as expressões à seguir tomando $\mathbf{u} = (2, -2, 3)$, $\mathbf{v} = (1, -3, 4)$ e $\mathbf{w} = (3, 6, -4)$.

a) $\|\mathbf{u} + \mathbf{v}\|$

d) $\|\mathbf{u}\| - \|\mathbf{v}\|$

g) $\|\mathbf{u} + \mathbf{v} + \mathbf{w}\|$

j) $\left| \left| -\|\mathbf{u}\| \mathbf{v} \right| \right|$

b) $\|\mathbf{u}\| + \|\mathbf{v}\|$

e) $\|-2\mathbf{u} + 2\mathbf{v}\|$

h) $\|3\mathbf{v} - 3\mathbf{w}\|$

k) $\|\mathbf{u}\| - 2\|\mathbf{v}\| - 3\|\mathbf{w}\|$

c) $\|\mathbf{u} - \mathbf{v}\|$

f) $\|3\mathbf{u} - 5\mathbf{v} + \mathbf{w}\|$

i) $\|3\mathbf{u}\| - 5\|\mathbf{v}\| + \|\mathbf{w}\|$

l) $\|\mathbf{u}\| + \|-2\mathbf{v}\| + \|-3\mathbf{w}\|$

Questão 3 Calcule as expressões à seguir tomando $\mathbf{u} = (-2, -1, 4, 5)$, $\mathbf{v} = (3, 1, -5, 7)$ e $\mathbf{w} = (-6, 2, 1, 1)$.

a) $\|\mathbf{u} + \mathbf{v}\|$

d) $\|\mathbf{u}\| - \|\mathbf{v}\|$

g) $\|\mathbf{u} + \mathbf{v} + \mathbf{w}\|$

j) $\left| \left| -\|\mathbf{u}\| \mathbf{v} \right| \right|$

b) $\|\mathbf{u}\| + \|\mathbf{v}\|$

e) $\|-2\mathbf{u} + 2\mathbf{v}\|$

h) $\|3\mathbf{v} - 3\mathbf{w}\|$

k) $\|\mathbf{u}\| - 2\|\mathbf{v}\| - 3\|\mathbf{w}\|$

c) $\|\mathbf{u} - \mathbf{v}\|$

f) $\|3\mathbf{u} - 5\mathbf{v} + \mathbf{w}\|$

i) $\|3\mathbf{u}\| - 5\|\mathbf{v}\| + \|\mathbf{w}\|$

l) $\|\mathbf{u}\| + \|-2\mathbf{v}\| + \|-3\mathbf{w}\|$

Questão 4 Seja $\mathbf{v} = (-2, 3, 0, 6)$. Encontre todos os possíveis valores de k tais que $\|k\mathbf{v}\| = 5$

Questão 5 Para os itens a seguir, calcule $\mathbf{u} \cdot \mathbf{v}$, $\mathbf{u} \cdot \mathbf{u}$ e $\mathbf{v} \cdot \mathbf{v}$.

a) $\mathbf{u} = (3, 1, 4)$ e $\mathbf{v} = (2, 2, -4)$

c) $\mathbf{u} = (1, 1, -2, 3)$ e $\mathbf{v} = (-1, 0, 5, 1)$

b) $\mathbf{u} = (1, 1, 4, 6)$ e $\mathbf{v} = (2, -2, 3, -2)$

d) $\mathbf{u} = (2, -1, 1, 0, -2)$ e $\mathbf{v} = (1, 2, 2, 2, 1)$

Questão 6 Em cada item a seguir, encontre o cosseno do ângulo θ entre $\mathbf{u}$ e $\mathbf{v}$.

a) $\mathbf{u} = (2, 3)$ e $\mathbf{v} = (5, -7)$

c) $\mathbf{u} = (1, -5, 4)$ e $\mathbf{v} = (3, 3, 3)$

b) $\mathbf{u} = (-6, -2)$ e $\mathbf{v} = (4, 0)$

d) $\mathbf{u} = (-2, 2, 3)$ e $\mathbf{v} = (1, 7, -4)$