

1-2 Videos Guide

1-2a

- Vector from $P(x_1, y_1, z_1)$ to $Q(x_2, y_2, z_2)$
(coordinates of terminal point) – (coordinates of initial point)
 - $\mathbf{a} = \langle x_2 - x_1, y_2 - y_1, z_2 - z_1 \rangle$

1-2b

- Vector arithmetic: let $\mathbf{a} = \langle a_1, a_2, a_3 \rangle$, $\mathbf{b} = \langle b_1, b_2, b_3 \rangle$, and c be a real number
 - Scalar multiplication: $c\mathbf{a} = \langle ca_1, ca_2, ca_3 \rangle$

1-2c

- Addition/subtraction: $\mathbf{a} \pm \mathbf{b} = \langle a_1 \pm b_1, a_2 \pm b_2, a_3 \pm b_3 \rangle$

1-2d

- Magnitude of a vector $\mathbf{a} = \langle a, b, c \rangle$
 - $|\mathbf{a}| = \sqrt{a^2 + b^2 + c^2}$
- Standard basis vectors for V_3
 - $\mathbf{i} = \langle 1, 0, 0 \rangle$
 - $\mathbf{j} = \langle 0, 1, 0 \rangle$
 - $\mathbf{k} = \langle 0, 0, 1 \rangle$

Exercise:

- Find a unit vector that has the same direction as the vector $-5\mathbf{i} + 3\mathbf{j} - \mathbf{k}$.