

17. All distances in this solution are understood to be in meters.

(a) $\vec{a} + \vec{b} = (4.0 + (-1.0))\hat{i} + ((-3.0) + 1.0)\hat{j} + (1.0 + 4.0)\hat{k} = 3.0\hat{i} - 2.0\hat{j} + 5.0\hat{k}.$

(b) $\vec{a} - \vec{b} = (4.0 - (-1.0))\hat{i} + ((-3.0) - 1.0)\hat{j} + (1.0 - 4.0)\hat{k} = 5.0\hat{i} - 4.0\hat{j} - 3.0\hat{k}.$

(c) The requirement $\vec{a} - \vec{b} + \vec{c} = 0$ leads to $\vec{c} = \vec{b} - \vec{a}$, which we note is the opposite of what we found in part (b). Thus, $\vec{c} = -5.0\hat{i} + 4.0\hat{j} + 3.0\hat{k}.$