

5. Since the velocity of the particle does not change, it undergoes no acceleration and must therefore be subject to zero net force. Therefore,

$$\vec{F}_{\text{net}} = \vec{F}_1 + \vec{F}_2 + \vec{F}_3 = 0 .$$

Thus, the third force \vec{F}_3 is given by

$$\begin{aligned}\vec{F}_3 &= -\vec{F}_1 - \vec{F}_2 \\ &= -\left(2\hat{i} + 3\hat{j} - 2\hat{k}\right) - \left(-5\hat{i} + 8\hat{j} - 2\hat{k}\right) \\ &= 3\hat{i} - 11\hat{j} + 4\hat{k}\end{aligned}$$

in Newtons. The specific value of the velocity is not used in the computation.