

$$\begin{aligned}
 \frac{1}{3} \quad \underline{V}_1 &= 15 \left( \frac{4}{5} \underline{i} + \frac{3}{5} \underline{j} \right) = 12 \underline{i} + 9 \underline{j} \\
 \underline{V}_2 &= 12 (-\cos 60^\circ \underline{i} + \sin 60^\circ \underline{j}) = -6 \underline{i} + 10.39 \underline{j} \\
 \underline{V}_1 + \underline{V}_2 &= 15 + 12 = \underline{27} \\
 \underline{V}_1 + \underline{V}_2 &= (12-6) \underline{i} + (9+10.39) \underline{j} = \underline{6 \underline{i} + 19.39 \underline{j}} \\
 \underline{V}_1 - \underline{V}_2 &= (12-(-6)) \underline{i} + (9-10.39) \underline{j} = \underline{18 \underline{i} - 1.392 \underline{j}} \\
 \underline{V}_1 \times \underline{V}_2 &= (12 \underline{i} + 9 \underline{j}) \times (-6 \underline{i} + 10.39 \underline{j}) \\
 &= (124.7 + 54) \underline{k} = \underline{178.7 \underline{k}} \\
 \underline{V}_2 \times \underline{V}_1 &= -(\underline{V}_1 \times \underline{V}_2) = \underline{-178.7 \underline{k}} \\
 \underline{V}_1 \cdot \underline{V}_2 &= (12 \underline{i} + 9 \underline{j}) \cdot (-6 \underline{i} + 10.39 \underline{j}) \\
 &= 12(-6) + 9(10.39) = \underline{21.5}
 \end{aligned}$$