LENGTH OF A VECTOR

1. Find the length of $\vec{u} = 2\hat{i} + 3\hat{j} + 4\hat{k}$.

2. Find the length of $\vec{v} = \hat{i} - 5\hat{j} + \hat{k}$.

3. Find the length of $\vec{w} = -3\hat{i} - 2\hat{j} - 8\hat{k}$.

4. Find the length of $\vec{v} = 3\hat{i} + 2\hat{j} - 2\hat{k}$.

5. Find a unit vector pointing in the same direction as $\vec{u} = 2\hat{i} + 3\hat{j} + 4\hat{k}$.

6. Find a unit vector pointing in the opposite direction as $\vec{v} = \hat{i} - 5\hat{j} + \hat{k}$.

7. Find a vector of length 2 in the direction of $\vec{v} = \hat{i} - 5\hat{j} + \hat{k}$.

8. Find a vector of length 10 in the direction of $\vec{w} = -3\hat{i} - 2\hat{j} - 8\hat{k}$.

9. Find a vector of length 2 in the direction opposite of $\vec{u} = 2\hat{i} + 3\hat{j} + 4\hat{k}$.

10. Find a unit vector pointing in the same direction as $\vec{w} = -3\hat{i} - 2\hat{j} - 8\hat{k}$.

11. If $\vec{u} = 2\hat{i} + 3\hat{j} + 4\hat{k}$, find the unit vector in the direction of $-\vec{u}$.

12. Prove that if $\vec{v} = a\hat{i} + b\hat{j} + c\hat{k}$ and $\vec{w} = 3a\hat{i} + 3b\hat{j} + 3c\hat{k}$, then $\|\vec{w}\| = 3\|\vec{v}\|$.