MAGNITUDE

$\vec{v} = a\vec{i} + b\vec{j} + c\vec{k}$

$\|\vec{v}\| = \sqrt{a^2+b^2+c^2}$

7. $v = 2i - 5j + 3k$

$\|v\| = \sqrt{2^2+(-5)^2+3^2}$

$= \sqrt{4+25+9}$

$= \sqrt{38}$

8. $v = 4i + j - 2k \quad w = -3i - j - 4k$

$2v - 5w$

$= 2(4i + j - 2k) - 5(-3i - j - 4k)$

$= 8i + 2j - 4k + 15i + 5j + 20k$

$= 23i + 7j + 16k$

9. $v = 4i + j - 2k \quad w = -3i - j - 4k$

$\|v\| + \|w\|$

$\sqrt{4^2+1^2+(-2)^2} + \sqrt{(-3)^2+(-1)^2+(-4)^2}$

$\sqrt{16+1+4} + \sqrt{9+1+16}$

$\sqrt{21} + \sqrt{26}$

UNIT VECTOR IN SAME DIRECTION AS v

$u = \frac{v}{\|v\|}$

10. $v = 5i - j + 2k$

$u = \frac{5i - j + 2k}{\sqrt{5^2+(-1)^2+2^2}}$

$u = \frac{5i - j + 2k}{\sqrt{25+1+4}}$

$u = \frac{5i - j + 2k}{\sqrt{30}}$

$u = \frac{5}{\sqrt{30}}i - \frac{1}{\sqrt{30}}j + \frac{2}{\sqrt{30}}k$

$u = \frac{5\sqrt{30}}{30}i - \frac{\sqrt{30}}{30}j + \frac{2\sqrt{30}}{30}k$

$u = \frac{\sqrt{30}}{6}i - \frac{\sqrt{30}}{30}j + \frac{\sqrt{30}}{15}k$