Answer on Question #67860 – Math – Analytic Geometry

Question

Find a unit vector parallel to the resultant vector A1=2i+4j−5k, A2=1+2j+3k
a) 3/7i+6/7j−2/7k
b)1/7i+63/7j−4/7
c)2/7i−3/7j−5/7
d)3/5i+6/5j−2/5

Solution

The resultant vector of $A_1 = 2i + 4j - 5k$ and $A_2 = i + 2j + 3k$ is
$A = A_1 + A_2 = (2i + 4j - 5k) + (i + 2j + 3k) = (2 + 1)i + (4 + 2)j + (-5 + 3)k = 3i + 6j - 2k.$

Its length is
$$|A| = \sqrt{9 + 36 + 4} = 7.$$
A unit vector parallel to the resultant vector is
$$\frac{A}{|A|} = \frac{3}{7}i + \frac{6}{7}j - \frac{2}{7}k.$$

Answer: a) $\frac{3}{7}i + \frac{6}{7}j - \frac{2}{7}k.$