Answer on Question #50840 – Math – Vector Calculus

Question

a and b are vectors defined by $a = 8i + 2j - 3k$ and $b = 3i - 6j + 4k$, where i, j, k are mutually perpendicular unit vectors. Calculate a and b.

Solution

Vectors i, j, k form a standard basis in $\mathbb{R}^3$, so $i = (1; 0; 0), j = (0; 1; 0), k = (0; 0; 1)$.

Then $a = 8i + 2j - 3k = (8; 0; 0) + (0; 2; 0) - (0; 0; 3) = (8; 2; -3)$.

Similarly

$b = 3i - 6j + 4k = (3; 0; 0) - (0; 6; 0) + (0; 0; 4) = (3; -6; 4)$.

Answer: $a = (8; 2; -3), b = (3; -6; 4)$.