Answer on Question #42440 – Math - Analytic Geometry

Let $\boldsymbol{u} = (-3, 4), \boldsymbol{v} = (8, 2)$.

Find $\boldsymbol{u} + \boldsymbol{v}$.

Given two vectors $\boldsymbol{u} = (u_1, u_2)$ and $\boldsymbol{v} = (v_1, v_2)$ in the Euclidean plane, the sum is given by:

$$\overrightarrow{\boldsymbol{u} + \boldsymbol{v}} = (u_1 + v_1, u_2 + v_2)$$

In other words, vector addition is just like ordinary addition: *component by component.*

Notice that if you add together two 2-dimensional vectors you must get another 2-dimensional vector as your answer. Addition of 3-dimensional vectors will yield 3-dimensional answers. 2- and 3-dimensional vectors belong to different vector spaces and cannot be added. These same rules apply when we are dealing with scalar multiplication.

Thus,

$$\overrightarrow{\boldsymbol{u} + \boldsymbol{v}} = (-3 + 8, 4 + 2)$$

$$\overrightarrow{\boldsymbol{u} + \boldsymbol{v}} = (5,6)$$

Answer: $\overrightarrow{\boldsymbol{u} + \boldsymbol{v}} = (5,6)$