Question 31562

$\vec{u}(1;3;-2), \vec{v}(4;-2;-4)$;
Vector $(a_1;a_2;a_3)$ is multiplied by scalar λ by following rule: $\lambda(a_1;a_2;a_3)=(\lambda a_1;\lambda a_2;\lambda a_3)$.
Vectors are added(or substracted) by components: $(a_1;a_2;a_3)+(b_1;b_2;b_3)=(a_1+b_1;a_2+b_2;a_3+b_3)$.
Using these rules, obtain $2\vec{u}+\vec{v}=(6;4;-8)$ and $\vec{u}-2\vec{v}=(-7;7;6)$.
The dot product of two vectors $\vec{a}(a_1;a_2;a_3)$ and $\vec{b}(b_1;b_2;b_3)$ is $\vec{a}\cdot\vec{b}=a_1b_1+a_2b_2+a_3b_3$.
Hence, $(2\vec{u}+\vec{v})\cdot(\vec{u}-2\vec{v})=-7\cdot6+4\cdot7+6\cdot(-8)=-62$.