**Problema 3.2** Se dau vectorii $\vec{a}(3,-1,-2)$ și $\vec{b}(1,2,-1)$. Să se calculeze:

$$\vec{a}\times\vec{b},\ (2\vec{a}+\vec{b})\times\vec{b},\ (2\vec{a}+\vec{b})\times(2\vec{a}-\vec{b})$$

Fie $\vec{a}=(x,y,z)$ și $\vec{b}=(x',y',z')$, atunci:

$$\vec{a}\times\vec{b}=(yz'-zy',\ zx'-xz',\ xy'-yx')$$

$$\vec{a}\times\vec{b}=(3,-1,-2)\times(1,2,-1)=$$

$$=((-1)\cdot(-1)-(-2)\cdot 2,\ (-2)\cdot 1-3\cdot(-1),\ 3\cdot 2-(-1)\cdot 1)=$$

$$=(1+4,\ -2+3,\ 6+1)=\underline{(5,1,7)}$$

$$(2\vec{a}+\vec{b})\times\vec{b}=?$$

$$2\vec{a}+\vec{b}=2\cdot(3,-1,-2)+(1,2,-1)=$$

$$=(6+1,\ -2+2,\ -4-1)=\underline{(7,0,-5)}$$

$$(2\vec{a}+\vec{b})\times\vec{b}=(7,0,-5)\times(1,2,-1)=$$

$$=(0\cdot(-1)-(-5)\cdot 2,\ (-5)\cdot 1-7\cdot(-1),\ 7\cdot 2-0\cdot 1)$$

$$=(0+10,\ -5+7,\ 14-0)=\underline{(10,2,14)}$$

$$(2\vec{a}+\vec{b})\times(2\vec{a}-\vec{b})=?$$

$$2\vec{a}-\vec{b}=2\cdot(3,-1,-2)-(1,2,-1)=$$

$$=(6-1,\ -2-2,\ -4+1)=(5,-4,-3)$$

$$(2\vec{a}+\vec{b})\times(2\vec{a}-\vec{b})=(7,0,-5)\times(5,-4,-3)=$$

$$=(0\cdot(-3)-(-5)\cdot(-4),\ (-5)\cdot 5-7\cdot(-3),\ 7\cdot(-4)-0\cdot 5)=$$

$$=(0-20,\ -25+21,\ -28-0)=$$

$$=\underline{(-20,-4,-28)}$$