Мавзу. Vektorlarning berilgan bazisga ko`ra koordinatalari va ularning xossalari. Vektor fazo ta'rifi.

Darsda yechiladigan misollar

Masala: ABCD tetraedrning qirralaridan iborat $\overrightarrow{AB}$, $\overrightarrow{AC}$, $\overrightarrow{AD}$ larni bazis vektorlar deb olib, $\overrightarrow{BC}$ ning shu vektorga nisbatan koordinatalarini toping.

Yechish $\overrightarrow{AB} = e_1$, $\overrightarrow{AC} = e_2$ va $\overrightarrow{AD} = e_3$ belgilaymiz.

$\overrightarrow{BC} = -\overrightarrow{AB} + \overrightarrow{AC} = \vec{e}_2 - \vec{e}_1 = -\vec{e}_1 + \vec{e}_2 = (-1)\vec{e}_1 + 1\cdot\vec{e}_2 + 0\cdot\vec{e}_3$ $\overrightarrow{BC}$ $(-1;\ 1;\ 0)$.

Misollar. $\vec{a}(3,\ -2,\ 1)$, $\vec{b}(-1,\ 0,\ -2)$ va $\vec{c}(1,\ 2,\ 0)$ vektorlar berilgan. $\vec{a}+\vec{b}$, $\vec{b}-\vec{c}$, $3\vec{a}$, $\vec{a}+\frac{1}{2}\vec{b}-3\vec{c}$ vektorlarning koordinatalarini aniqlang.

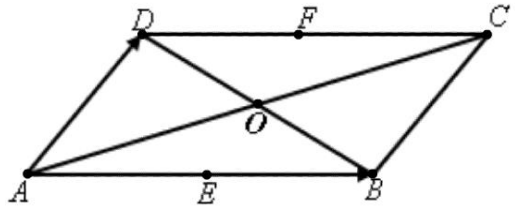
Yechish $\vec{a}+\vec{b} = (3+(-1));\ (-2)+0;\ (\vec{a}+\vec{b})(2;\ -2;\ -1);$ $\vec{b}-\vec{c}$ vektor koordinatalar $(\vec{b}-\vec{c})(-2;\ -2;\ -2);\ 3\vec{a}(3;\ -2;\ 1) = \vec{a}(9;\ -6;\ 3);$

$$\vec{p} = (\vec{a}+\frac{1}{2}\vec{b}-3\vec{c})(3-\frac{1}{2}-3;\ -2+\frac{1}{2}\cdot 0-3\cdot 2;\ 1+\frac{1}{2}(-1)-3\cdot 0)$$

bundan $\vec{p}(-\frac{1}{2},\ -8,\ 0)$

Tekshirish uchun savollar va mashqlar.

1. Vektor fazo deb nimaga aytiladi?
2. Bazis vektorni ta'riflang.
3. Vektor koordinatalari deb nimaga aytiladi?
4. *ABCD* – parallelogramm berilgan *E* va *F* qarama-qarshi tomonlar *BC* va *AD* ning o'rta nuqtalari bo'lsin, *O*-diagonallarining kesishgan nuqtasi.



10-chizma

$\overrightarrow{AB} = e_1$, $\overrightarrow{AD} = e_2$ bazis vektorlar bo'lsin deb, quyidagi vektorlarning koordinatalarini aniqlang: (10-chizma).

1) $\overrightarrow{AC}$, $\overrightarrow{BD}$ 2) $\overrightarrow{OD}$; 3) $\overrightarrow{FC}$; 4) $\overrightarrow{BC}$; 5) $\overrightarrow{EO}$; 6) $\overrightarrow{EA}$

5. $\vec{a}_1(1,1)$, $\vec{a}_2(2,1)$, $\vec{a}_3(-3,2)$ vektorlar berilgan. $\vec{p} = 2\vec{a}_1 - 3\vec{a}_2 + \vec{a}_3$ vektorning koordinatalarini aniqlang.

Javob: $\vec{p}(-7;\ 1)$

6. Tekislikdagi $\vec{u}(2,\ 1)$ va $\vec{v}(1,\ 0)$ vektorlar berilgan, *p(9.1)* vektor $\vec{u}$ va $\vec{v}$ vektor bo'yicha yoyilgan, yoyilmaning koeffitsientlarini aniqlang. $(\vec{p} = x\vec{u} + y\vec{v})$

Javob: $\vec{p}(1;\ 7)$

7. Koordinatalari bilan berilgan $\vec{a}(x_1,\ y_1)$ va $\vec{b}(x_2,\ y_2)$ vektorlar kollinear bo'lishi uchun, ularning koordinatalarning proportsional bo'lishi zarur va etarli ekanini isbotlang.

8. Quyidagi juft vektorlarning kollinear juftlarni ajrating.

1) $\vec{a}(1,\ 2):\ \vec{b}(2,\ 3)$ 2) $\vec{a}(-\sqrt{2},\ 3):\ \vec{b}(2\sqrt{2},\ -6)$ 3) $\vec{a}(0,\ 5):\ \vec{b}(0,\ 7)$

Javob: 1. kollinear emas;

2. kollinear;

3. kollinear.

9. $\vec{a}(1,\ 5)$, $\vec{b}(3,\ -1)$ va $\vec{c}(0,\ 1)$ vektorlar berilgan.

$\vec{p} = \vec{a} + x\vec{b}$, x ning qanday qiymatida bu vektor $\vec{q} = \vec{a} - \vec{c}$ vektorga kollinear bo'ladi.

Javob: $x = \frac{1}{13}$