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Determining a Point Symmetrical to the OY Axis in the Affine Coordinate System

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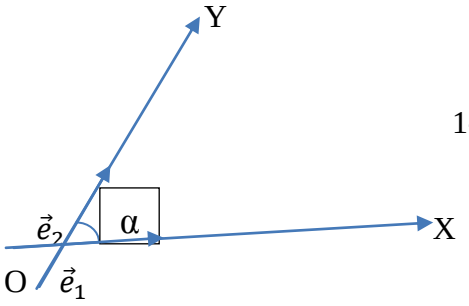
Abstract. In the affine coordinate system, a more convenient formula for finding a symmetrical point of a point M with respect to the OY axis was given to the students. It is more convenient to find the point through this formula than through the drawing, and at the same time it was reflected in the drawing.

Key words: Affine rapier, symmetric, Cartesian coordinate system, collinear, ordinate, abscissa, coordinate vectors.

Let us be given a point O in the plane. Any two non-collinear vectors from this point are given. The system consisting of OX and OY axes, whose positive directions are determined by vectors, respectively, is called an affine coordinate system in the plane (Figure 1)

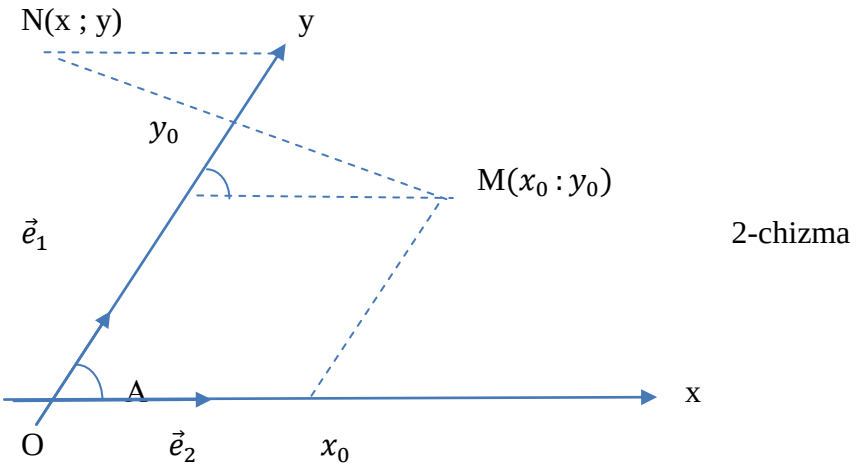


1-chizma

The point O in diagram 1 is called the origin of coordinates, and the vectors are called coordinate vectors. In this, OY is called the ordinate axis, and OX is called the abscissa axis. The affine coordinate system can also be called an affen frame and it is defined as {O , , }.

Cartesian coordinate system is a special case of affine rapier and defined as

Let a point A be given in the affine coordinate system. Many students find it difficult to find a point where it is symmetrical about the OY axis. Therefore, it is appropriate to use the following formula to find a symmetrical point with respect to the Moon. This formula greatly helps students to find a symmetrical point with respect to OY and is suitable for an arbitrary angle α. (Figure 2)

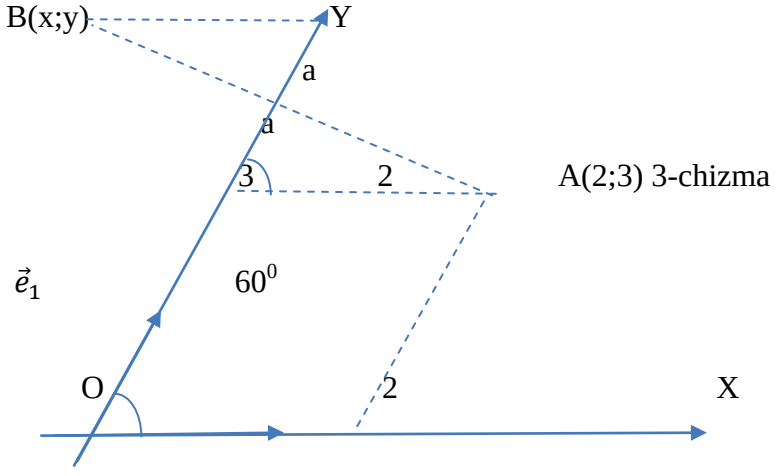


$$\begin{cases} x = -x_0 \\ y = y_0 + 2x_0 cos\alpha \end{cases} (1)$$

Formula 1 can help students a lot. This formula was proved by the student of the Faculty of Mathematics and Informatics Kholimmatova Marjona Tojiboy and supported by the problems.

Issue 1

In the affine coordinate system of the point A(2,3), find the coordinates of the point symmetrical to the OY axis and draw a diagram. A =600



It follows that

In the affine coordinate system, we can find the symmetrical point with respect to the OY axis by equation (1). To find the point B(x;y) we need to find x and y. For this we need a. Cos600=a/2

The coordinates of the point symmetrical to the OY axis are B(-2;5) and its image is

presented in diagram 3.

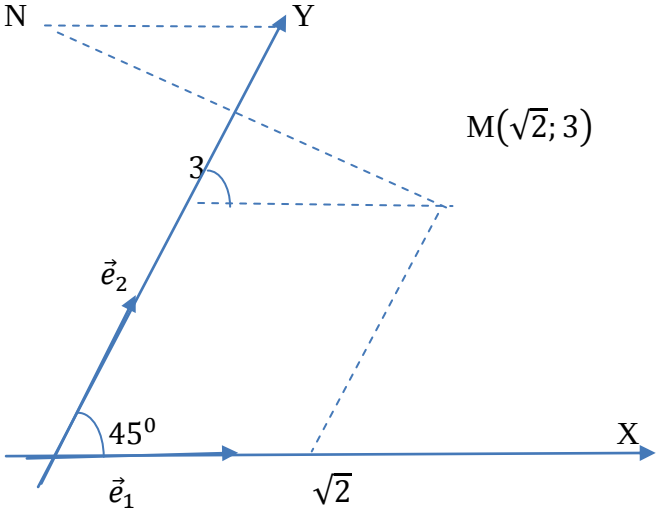
Issue 2.

In the affine coordinate system of the point M, find the coordinates of the point N, which is symmetrical with respect to the OY axis, and draw a diagram.a= $\vec{e}_2$

$$\begin{cases} x = -x_0 \\ y = y_0 + 2x_0 cos\alpha \end{cases}$$

We find the coordinates using the formula.

$$\Rightarrow \begin{cases} x = -\sqrt{2} \\ y = 3 + 2 * \sqrt{2} * 1/\sqrt{2} \end{cases} \Rightarrow N(-\sqrt{2}; 5)$$



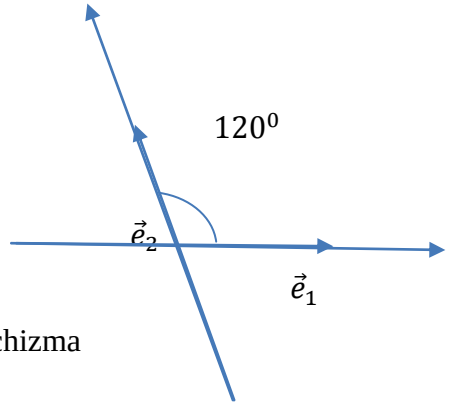
4-chizma

The coordinates of the point symmetrical to the OY axis are shown in Figure 4.

Issue 3.

In the affine coordinate system of the point K(5;4), find the coordinate of the point L, which is symmetrical about the axis

OY.a=(=



5-chizma

$\cos 120^0$=-1/2

$$\begin{cases} x = -x_0 \\ y = y_0 + 2x_0 cos\alpha \end{cases} \Rightarrow \begin{cases} x = -5 \\ y = 4 + 2 * 5 * (-\frac{1}{2}) \end{cases} \Rightarrow \begin{cases} x = -5 \\ y = -1 \end{cases}$$

The coordinates of the point symmetrical to the OY axis are L(-5;-1) and are depicted in Figure 5.

List of used literature

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