CURVES OF THE SECOND ORDER

Tasks.

1. a) Define a type of a curve. b) Reduce the given equation to a canonical form. c) Find lengths of semi-axes, an eccentricity, equations of directixes, coordinates of focuses, equations of asymptotes. d) Draw a curve.

1) $4x^2 + 9y^2 - 40x + 36y + 100 = 0$;	3) $4x^2 - y^2 - 8x - 2y + 3 = 0$;
2) $x^2 + y^2 - 4x + 8y - 16 = 0$;	4) $4x^2 + 3y^2 - 8x + 12y - 32 = 0$;

2. Write down the equation of a circle if $A(3;9)$ and $B(7;3)$ are endpoints of its diameter.

3. An ellipse passes through points $A\left(\sqrt{3};-2\right)$ and $B\left(-2\sqrt{3};1\right)$. Form an equation of its ellipse.

4. Form an equation of hyperbola if it passes through point $\left(10;-3\sqrt{3}\right)$ and has asymptotes $y = \pm\dfrac{3}{5}x$.

5. Form an equation of hyperbola if the distance between focuses is $2c = 10$ and the eccentricity is $\varepsilon = \dfrac{5}{3}$.

6. Form an equation of hyperbola if it has asymptotes $y = \pm\dfrac{12}{5}$ and the distance between vertices equals 48.

7. An ellipse passes through points $A(3;0)$ and $B(0;-4)$. Form an equation of its ellipse.

8. Write down the equation of a circle passing through three points $A(4;1)$, $B(-3;-6)$ and $C(5;0)$.

9. Write down the equation of a parabola if its focus is $F(4;3)$ and its diretrix is $y + 1 = 0$.