Q1:

1- Find center and radius of each circle:
   a. \((x - 3)^2 + (y - 7)^2 = 19\)
   b. \(x^2 + y^2 - 6x + 4y = 12\)

2- Find equation of the ellipse with center at the origin, one vertex at \((0, 5)\), and one focus at \((0, 2)\).

3- Find coordinates of vertices and foci, of each ellipse:
   a. \(9(x + 1)^2 + 4(y + 5)^2 = 36\)
   b. \(9x^2 + 16y^2 - 18x - 64y - 71 = 0\)

Q2:

1- Find equation of the parabola with vertex \((0, 0)\), and directrix \(x = 2\).

2- A hyperbola has equation \(y^2 - 25x^2 = 25\)
   a. Is its major axis horizontal or vertical? Explain.
   b. What are its vertices and foci?
   c. What is the equation of its asymptote?
   d. If the hyperbola is translated 6 units to the right and 5 units down, what would be its new equation?

3- Use the definition of parabola to find its general equation.
Q3:
1- Find the vertex, focus, and directrix of each parabola

   \[ a. \quad 4(y + 3) = (x - 2)^2 \]
   \[ b. \quad y^2 - 6y + 16x + 25 = 0 \]

2- Discuss the graph of the equation

   \[ 9x^2 - 4y^2 - 54x - 16y + 29 = 0 \]

3- Discuss and sketch the graph of the equation

   \[ xy = 2 \]

Q4:
1- Give the \((x, y)\) coordinates for each \((r, \theta)\) points:

   a. \((-3, 90°)\)   \hspace{1cm} b. \((4, 120°)\).

2- Find equation of the hyperbola with center \((5, 0)\), one vertex is \((9, 0)\); one foci is \((10, 0)\).

3- Determine if the graph of the equation is circle, parabola, hyperbola, or ellipse

   \[ 41x^2 - 24xy + 34y^2 - 25 = 0 \]