

Name: _____

Panther ID: _____

Spring 2014

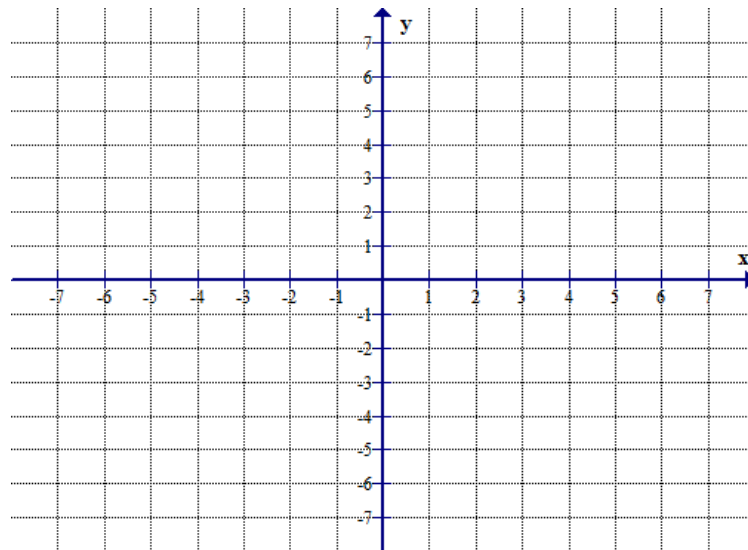
MAC 1140 - Precalculus Algebra

Test # 4

There are 7 problems for a total of 110 points. **Show your work**; an answer alone, even correct, will get no credit. An illegible answer will not be graded, so write your work neatly. Organize your work, so it is clear what you do and why. It might be necessary to use English sentences to write explanations.

Problem 1. (12 pts) Graph the equation

$$\frac{x^2}{9} - \frac{y^2}{25} = 1$$

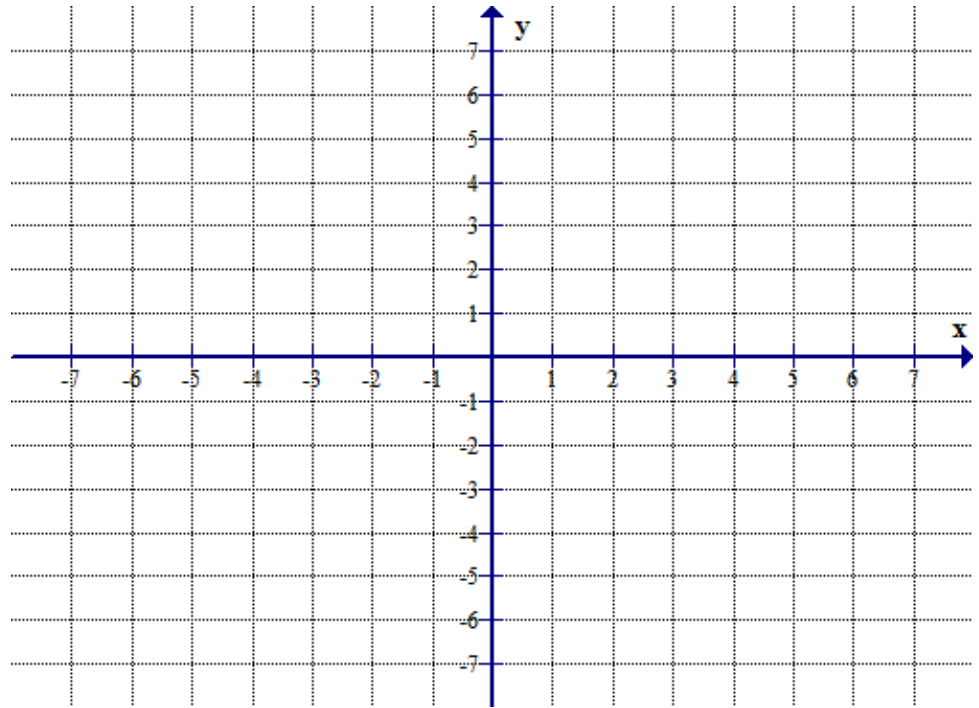


Problem 2. (18pts) Compute the following determinants

a) $\begin{vmatrix} 3 & -2 \\ 1 & 4 \end{vmatrix}$

b) $\begin{vmatrix} 2 & 0 & 3 \\ 1 & -1 & 4 \\ -2 & 1 & 3 \end{vmatrix}$

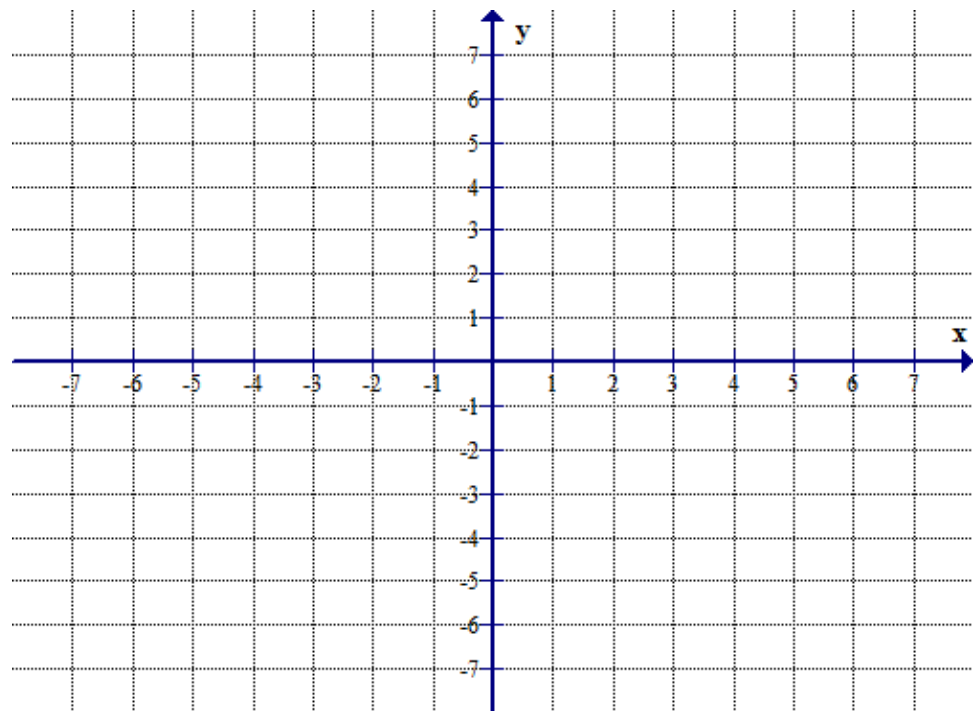
Problem 3. (16 pts) Find the equation of an ellipse with the center at $(3, -1)$, a vertex at $(3,3)$ and a focus at $(3,-4)$. Graph the ellipse. Provide coordinates for the other vertex and focus. ($\sqrt{7} \approx 2.6$)



Problem 4. (16 pts) Use the Cramer's Rule to write the solutions to the following system of equations. You **do not have** to evaluate the determinants.

$$\begin{cases} x + 4y - 3z = -8 \\ 3x - y + 3z = 12 \\ x + y + 6z = 1 \end{cases}$$

Problem 5. (18pts) Write the equation $x^2 + 6x - 4y^2 - 16y + 9 = 0$ in the standard form. Graph the equation and list all characteristics of the curve (for parabola- vertex, focus, directrix; for ellipse- center, vertices, foci; for hyperbola- center, vertices, foci, the equations of the asymptotes)



Problem 6. (12 pts) Identify conics given by the following equations. If an equation does not describe a conic, say so.

a) $2x^2 + 6y^2 + 7x + 8y + 1 = 0$ _____

b) $x^2 - 3y^2 - 4x - 12 = 0$ _____

c) $7x^2 - y + 1 = 0$ _____

d) $3y^2 + 3x^2 - 5y + 8 = 0$ _____

e) $8y^2 - 2x + 1 = 0$ _____

f) $y = x^3 + 7x^2 - 3x + 4$ _____

Problem 7. (18 pts) Graph both equations in the given system and determine the number of solutions. If there are solutions, solve the system.

$$\begin{cases} \frac{x^2}{4} + y^2 = 1 \\ x - y = 1 \end{cases}$$

