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NO CALCULATORS ON THIS SECTION EXCEPT FOR ARITHMETIC CALCULATIONS – ALL WORK MUST BE SHOWN TO RECEIVE CREDIT!!!!

1. Given the following matrix:

$$\begin{bmatrix} 1 & 0 \\ -3 & 1/2 \\ 4 & 1 \\ 2/3 & -1 \end{bmatrix}$$

a. Determine the order (size) of the matrix:

a. _____(2)

2. Write the **augmented** matrix for the following system:

$$\begin{aligned} 5x - 3y &= 1 \\ -4x &= -2 \end{aligned}$$

2. _____(3)

3. Given the following matrix in upper triangular form, solve the system for x, y and z.

$$\begin{bmatrix} 1 & 2 & -2 & \vdots & 2 \\ 0 & 1 & 3 & \vdots & -1 \\ 0 & 0 & 2 & \vdots & -2 \end{bmatrix}$$

x=_____y=_____z=_____ (4)

4. Using **matrix** methods, solve the following system. **If you use your calculator to do the problem, list the operations you used to get the solution, otherwise show ALL work.** (8 points) Write your answer as an (x,y,z) coordinate point.

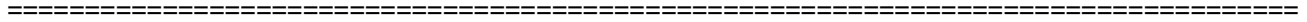
NOTE: rref is NOT an acceptable calculator method to solve this problem you must use matrix row operations!!!!

$$x - 2y - z = 1$$

$$-x + 3y + 3z = 4$$

$$2x - 3y + z = 10$$

Solution: _____



5. Find the values of a, b, and c such that the graph of the quadratic equation $y = ax^2 + bx + c$ passes through the points $(-1, -7)$, $(2, 2)$, and $(3, 1)$. (8 points)

Set up the system and solve it. Use your calculator and the RREF command for this one. Write your answer as $y = ax^2 + bx + c$.

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6. Solve the following non-linear system: $\begin{cases} xy = 1 \\ y = 2x + 1 \end{cases}$ _____(8)

State your answers as coordinate points.

7. Solve the following non-linear system: $\begin{cases} x^2 + y^2 = 6 \\ 3x^2 - y^2 = 10 \end{cases}$ _____(8)

State your answers as coordinate points.

8. Identify the following conic sections: (2 points each)

i) $4x^2 + 2y^2 = 16$ i) _____

- a) Circle b) Parabola c) Ellipse d) Hyperbola

ii) $6x^2 + 8x - y = 20$ ii) _____

- a) Circle b) Parabola c) Ellipse d) Hyperbola

iii) $16x^2 - 16y^2 = 32$ iii) _____

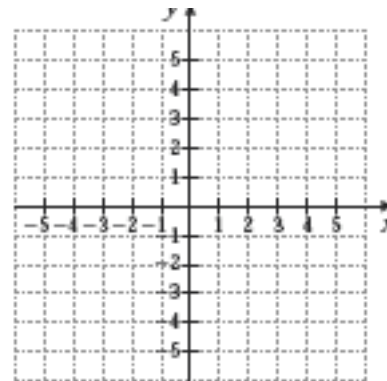
- a) Circle b) Parabola c) Ellipse d) Hyperbola

iv) $9x^2 + 9y^2 = 36$ iv) _____

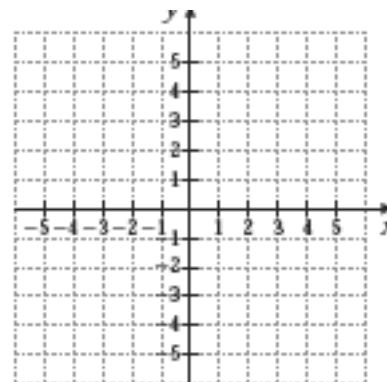
- a) Circle b) Parabola c) Ellipse d) Hyperbola

9. Graph the following Conic Sections:

a) $\frac{(x-3)^2}{4} + \frac{(y+2)^2}{9} = 1$ (5 points)



b) $\frac{(y-2)^2}{9} - \frac{(x+1)^2}{4} = 1$ (5 points)





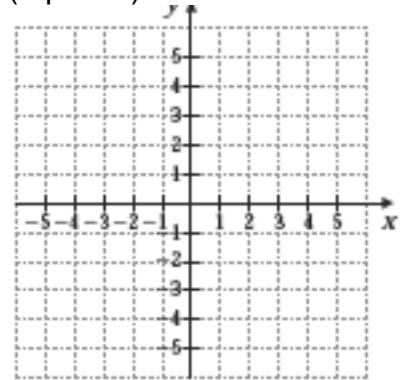
c) $x = -3(y - 1)^2 + 2$

(3 points)

Opens: _____ (1)

Vertex: _____ (2)

Axis of Symmetry: _____ (1)



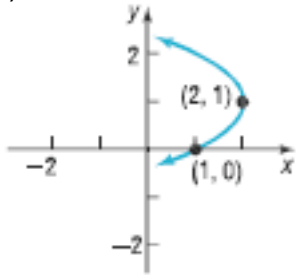
x-Intercept(s): _____ (3)

y-Intercept(s): _____ (3)

10. Given the following graphs find the equation of the conic sections in standard form.

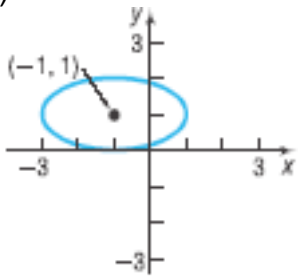
a)

a) _____ (5)



b)

b) _____ (4)



c)

c) _____ (4)

