

Math 1120F - Exam 5

Name: _____

Thursday, December 11, 2014

Time: 50 minutes

Instructor: Brittany Cuchta

Instructions:

- Do not open the exam until I say you may.
- All cell phones and other electronic noisemaking devices must be turned off or completely silenced (i.e., not on vibrate) for the duration of the exam.
- **No calculators** are allowed on the exam.
- The exam *must* be taken in pencil. Using a pen on the exam will result in the loss of points.
- Failure to follow directions specific to a problem will result in the loss of points.
- Circle or box your final answer where appropriate. Put your final answer in the provided space when available. Failure to do so will result in points being deducted.
- Show **all** work. Full credit will only be given if work is shown which **fully and clearly** justifies your answer. I reserve the right to not grade a problem which I cannot read.
- Answers must be exact (like $\sqrt{2}$), not approximate (like 1.414), unless a problem specifically indicates otherwise.
- All final answers must be simplified unless otherwise specified. **Rationalization is not required unless otherwise specified.**
- If you run out of room, use the back of the page and indicate this on the question.
- As always, you are expected to exhibit academic integrity during the exam.

Page:	1	2	3	4	Total
Points:	26	14	18	17	75
Score:					

1. (6 points) Identify each conic. Clearly circle your answer. No partial credit will be awarded.

(a) $4x^2 + 9y^2 - 16x - 18y = 0$ ellipse parabola hyperbola not a conic

(b) $y^2 - 4y - 4x^2 + 8x = 4$ ellipse parabola hyperbola not a conic

(c) $4y^2 - y = x - 2$ ellipse parabola hyperbola not a conic

2. (12 points) Find an equation for the ellipse with foci at $(1, 2)$ and $(-3, 2)$ and one vertex at $(-4, 2)$.

Center: _____

$a =$ _____

$b =$ _____

$c =$ _____

Equation: _____

3. (8 points) Given the equation below, find the vertex, focus, and directrix.

$$(y - 2)^2 = -8(x + 1)$$

Vertex: _____

Focus: _____

Directrix: _____

4. (8 points) Using row-reduction techniques, find the following inverses. Using any other method will result in **no points** being awarded. If the matrix does not have an inverse, state that it is singular.

(a) $A = \begin{bmatrix} 4 & 6 \\ 1 & 3 \end{bmatrix}$

$$A^{-1} = \underline{\hspace{2cm}}$$

(b) $B = \begin{bmatrix} 4 & -8 \\ -1 & 2 \end{bmatrix}$

$$B^{-1} = \underline{\hspace{2cm}}$$

5. (6 points) Given that $A = \begin{bmatrix} 1 & 0 \\ 2 & 4 \\ -1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & -3 & 0 \\ 1 & 1 & -2 \end{bmatrix}$, find AB .

$$AB = \underline{\hspace{2cm}}$$

6. (10 points) Solve the following system using Cramer's Rule. Any other method will result in **no points** being awarded.

$$\begin{cases} 3x - 4y - 12 = 0 \\ 5x + 2y + 6 = 0 \end{cases}$$

Solution: _____

7. (8 points) Find the determinant of the following matrix using cofactor expansion. Any other method will result in **no points** being awarded.

$$\begin{bmatrix} 2 & 1 & -3 \\ 5 & 0 & 1 \\ 2 & 6 & 0 \end{bmatrix}$$

Solution: _____

8. (8 points) Harper and Lydia work for the Salvation Army and want to purchase 200 articles of clothing. There is a sale going on at a local store where all shirts are \$10 dollars and all jeans are \$45. If they want to use their entire budget of \$6550, how many of each should they buy?

9. (5 points) Find the coefficient of the x^3 in the expansion of $(2x + 1)^{12}$.

Solution: _____

10. (4 points) Express using summation notation: $1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4} + \cdots + \frac{1}{13}$

Solution: _____