

**Exam #4, ver. A**

April 4, 2017

Name \_\_\_\_\_

- You will be told when to begin the work and when to terminate work on the examination. You must stop when instructed. Points may be deducted in case of violations.
- Please show your work to support your answers that require calculations. Correct but unsupported answers may not be given full credit.
- The use of a cell phone or other electronic communication devices during the examination is not allowed. The exam will be canceled and a grade of “0” will be assigned to anyone who uses a cell phone during the examination or if one is found within hands reach.
- Calculators are not allowed on this exam.
- The exam consist of two parts. Part I contains 5 multiple choice questions worth 5 points each. Part II contains 3 open ended questions worth 30 points each if not stated otherwise.

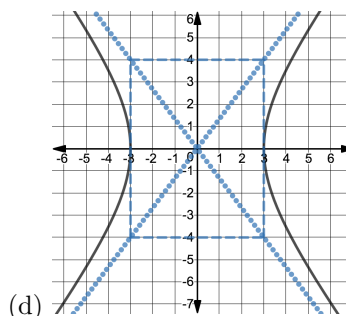
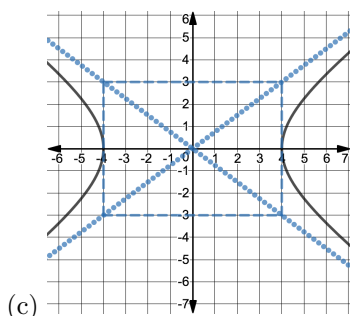
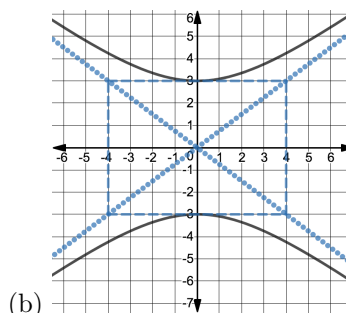
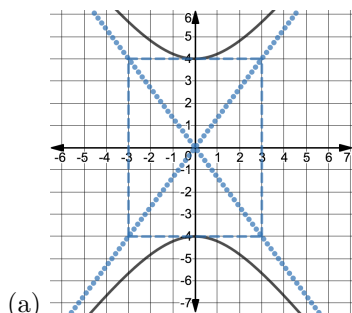
## Part I

Choose your answer from available choices. No partial credit will be given for wrong answers.

1. Which of the following is the equation of a hyperbola?

- (a)  $4x^2 - 25y^2 - 24x + 250y - 489 = 0$
- (b)  $x^2 + y^2 + 6x - 2y + 6 = 0$
- (c)  $y^2 + 12x + 2y - 23 = 0$
- (d)  $9x^2 + 25y^2 - 54x + 50y - 119 = 0$
- (e) None of the above

2. Which of the following is the graph of the equation  $\frac{x^2}{16} - \frac{y^2}{9} = 1$ ?



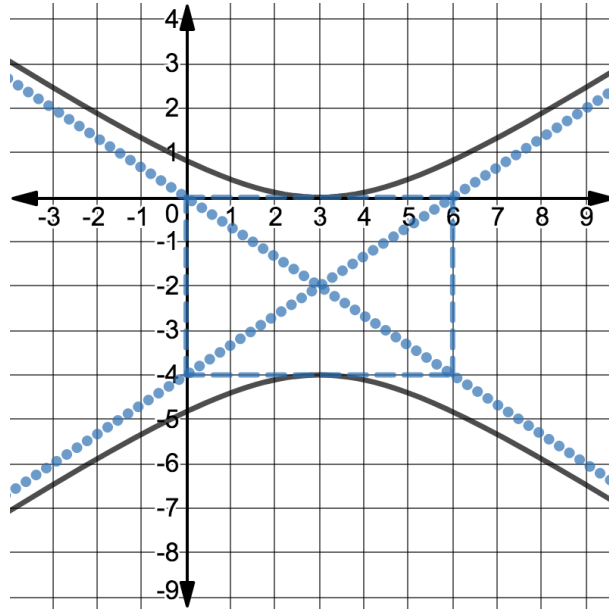
3. In the standard equation of an hyperbola,  $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ , the relationship between  $a$ ,  $b$ , and  $c$  can be described by the following equation

- (a)  $a^2 = b^2 + c^2$
- (b)  $b^2 = a^2 + c^2$
- (c)  $c^2 = b^2 + a^2$
- (d) None of the above

4. A parabola has the vertex at  $(0, 0)$  and the focus at  $(4, 0)$ . The equation of the directrix is

- (a)  $y = 4$
- (b)  $y = -4$
- (c)  $x = 4$
- (d)  $x = -4$
- (e) None of the above

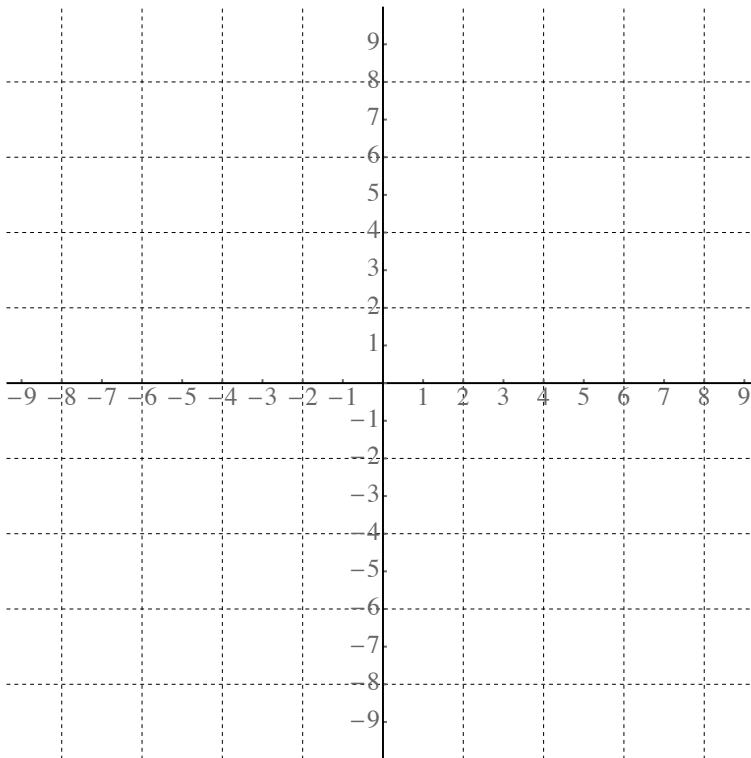
5. The equations of the asymptotes for the hyperbola below are



- (a)  $y - 2 = \pm \frac{3}{2}(x - 3)$
- (b)  $y - 2 = \pm \frac{2}{3}(x - 3)$
- (c)  $y = -2 \pm \frac{3}{2}(x - 3)$
- (d)  $y = -2 \pm \frac{2}{3}(x - 3)$
- (e) None of the above

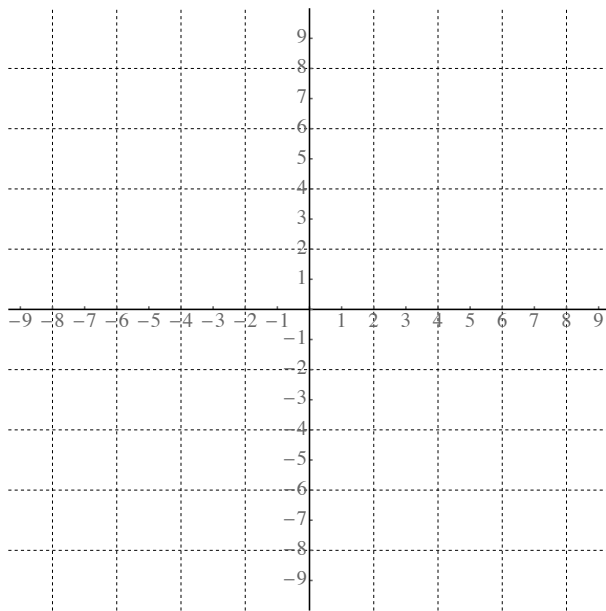
### Part II

6. (25 pts) Find the equation of the hyperbola with vertices  $(0, -5)$ ,  $(0, 5)$  and a focus  $(0, \sqrt{29})$ . Graph the hyperbola and find the equations of asymptotes.



7. Transform the general equation of an ellipse below into its standard form. Graph the ellipse and determine the coordinates of the center, vertices and foci.

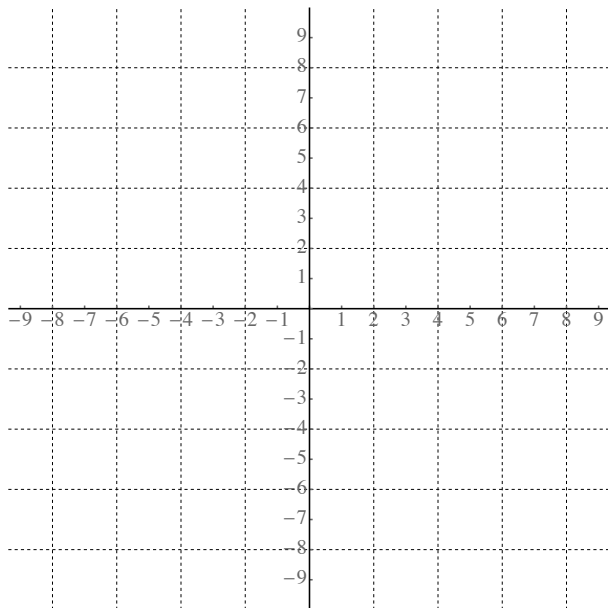
$$9x^2 + 16y^2 + 32y - 128 = 0$$



8. Find the vertex, focus and the equation of the directrix for the parabola

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

Graph the parabola.



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