

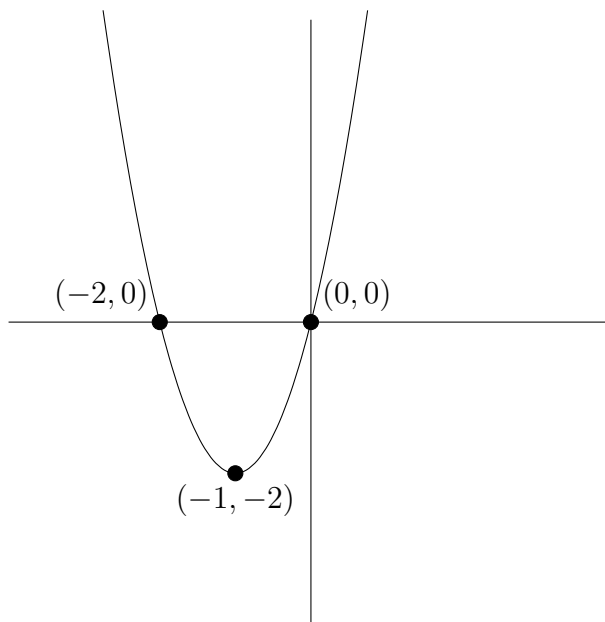
Math-19 Exam #4

Name: _____

This exam is closed book and notes. You may use a calculator and both sides of a 3×5 note card; however, no cell phones or tablets are allowed. Show all work; there is no credit for guessed answers. All values should be exact with no decimals unless you are specifically asked for an approximate or decimal answer.

| problem | score |
|---------|-------|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| TOTAL | |

1). Shown below is the graph for the parabola $y = 2(x + 1)^2 - 2$:



a). State a limited explicit domain (in interval notation) such that the function with your limited domain has an inverse.

b). How do you know that the function with your limited domain has an inverse?

c). Determine the inverse function.

d). Assuming that it is in your selected domain, what is $f^{-1}(-2)$?

2). A parabola has its focus at $(-1, 2)$ and its directrix at $x = 1$.

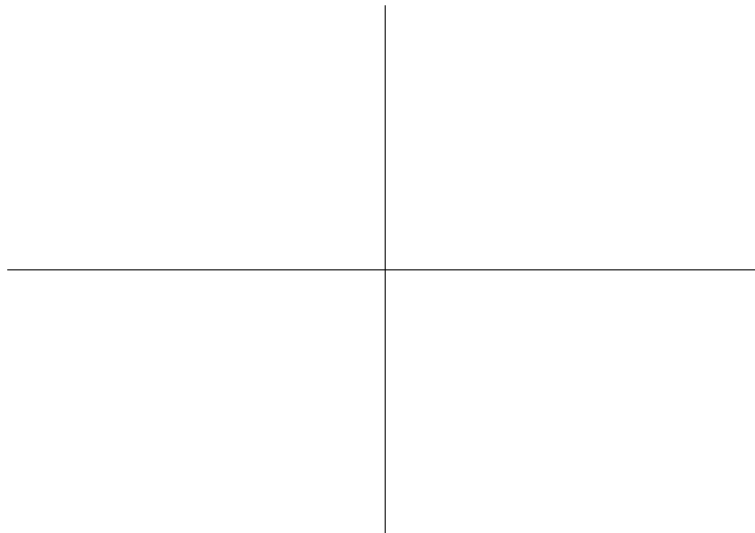
a). What are the coordinates of the vertex?

b). What is the value for p ?

c). What are the y -intercepts (if any)?

d). What are the x -intercepts (if any)?

e). Sketch the graph. For full credit you must show the vertex, focus, directrix, and any intercepts.



3). Consider the conic section:

$$16x^2 + y^2 + 32x - 2y + 13 = 0$$

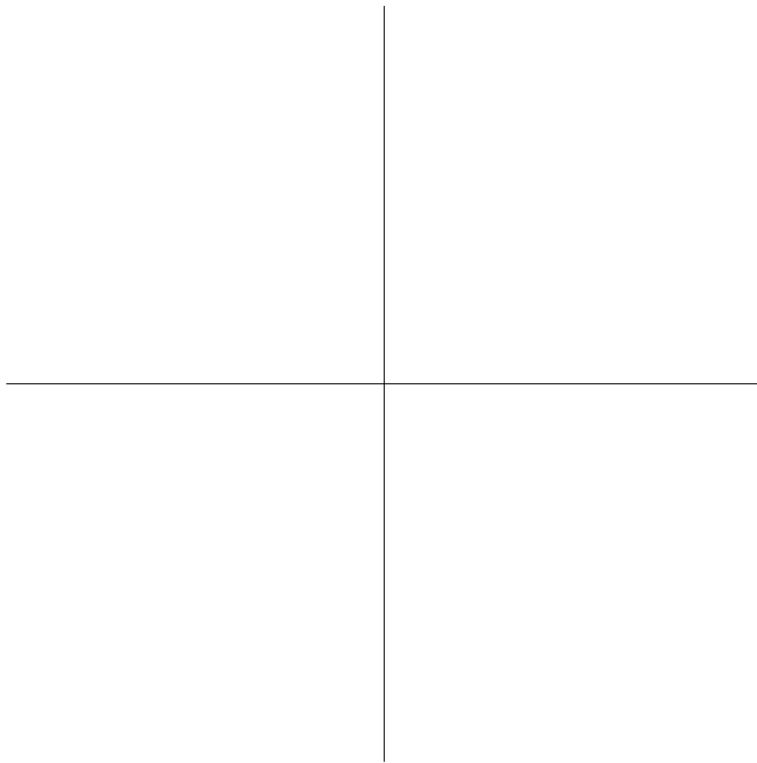
a). What are the values for a , b , and c ?

b). What are the coordinates of the center?

c). What are the coordinates of the foci?

d). What are the coordinates of the vertices?

e). Sketch the graph. For full credit you must show the center, foci, and all vertices.



4). Solve for x :

$$\log_4(x) + \log_4(x - 1) = \frac{1}{2}$$

- 5). Some archaeologists are digging at what appears to be a pre-Columbian human campsite in California. They find some animal bones with human teeth marks on them. Upon carbon-14 analysis, it is found that the bones have 75% of their original C_{14} . About how old are the bones, and hence the campsite? The half-life of C_{14} is 5730 years.