

YOUR NAME: \_\_\_\_\_

George Voutsadakis

Read each problem **very carefully** before starting to solve it. Each problem is worth around 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. (a) Find an equation for the parabola with focus  $(-6, 4)$  and directrix  $x = 4$  (please, sketch the graph).

- (b) Find the vertex, the focus and the directrix of the parabola  $6x - 3y^2 - 12y + 4 = 0$  (please, sketch the graph).

2. (a) An ellipse has center  $(0, 3)$ , foci at  $(0, 0)$  and  $(0, 6)$  and minor axis of length 4. Find an equation for it (please, sketch the graph).

- (b) Find the center, the vertices and the foci of the ellipse with equation

$$x^2 + 9y^2 - 2x - 18y - 1 = 0.$$