Pre-Calculus Homework #9

1) Solve $\log_2(3x^2 + 26x - 56) = 5 + \log_2(x - 1)$

2) Joshua invests $246,978 in a bank account that earns 4.3% interest compounded continuously. When he closes the account, the bank gives him $755,439.17. How many years did he keep the money in that bank account? (round your answer to the nearest whole number) If Joshua had invested that same amount for the same amount of time and at the same interest rate in a bank that was compounding interest semiannually, how much money would Joshua have lost?

3) Solve $\ln(2x^2 + 19x + 44) = \ln(x + 4) + 3$ exactly and approximately (rounded to three decimal places).

4) The magnitude of earthquakes is measured using the Richter scale. The formula for calculating the magnitude is $M = \log A - 2.48 + 2.76\log D$ where M is the magnitude, A is the amplitude of the wave recorded on the seismograph measured in micrometers, and D is the distance the seismograph is away from the epicenter of the earthquake measured in kilometers. If you are standing next to a seismograph that records an earthquake of magnitude 7.2 and you are exactly 1641.7 kilometers away from the epicenter, what is the amplitude of the wave as recorded on the machine? (round your answer to one decimal place)

5) Solve $\log_6(x - 2) + \log_6(3x + 2) = \log_6(12x^2 - 4x - 33) - \log_6(2x + 3)$

6) Identify the conic section, find the standard form of the equation of the conic, find any vertices, centers, foci, radii, directrices, major and minor axes, axes of symmetry, and graph the equation $3y = 6x^2 - 24x - 5$ including the locations of any vertices, centers, foci, directrices, major and minor axes, or axes of symmetry in your graph.

7) Identify the conic section, find the standard form of the equation of the conic, find any vertices, centers, foci, radii, directrices, major and minor axes, axes of symmetry, and graph the equation $2x^2 + 12y + 16 = 16x - 2y^2 - 2$ including the locations of any vertices, centers, foci, directrices, major and minor axes, or axes of symmetry in your graph.

8) Identify the conic section, find the standard form of the equation of the conic, find any vertices, centers, foci, radii, directrices, major and minor axes, axes of symmetry, and graph the equation $36x^2 + 324y + 360 = 216x - 81y^2 + 2628$ including the locations of any vertices, centers, foci, directrices, major and minor axes, or axes of symmetry in your graph.

9) Identify the conic section, find the standard form of the equation of the conic, find any vertices, centers, foci, radii, directrices, major and minor axes, axes of symmetry, and graph the equation $-2x = 4y^2 - 32y + 50$ including the locations of any vertices, centers, foci, directrices, major and minor axes, or axes of symmetry in your graph.

10) Identify the conic section, find the standard form of the equation of the conic, find any vertices, centers, foci, radii, directrices, major and minor axes, axes of symmetry, and graph the equation $3y^2 + 36x - 30 = 30y - 3x^2 - 66$ including the locations of any vertices, centers, foci, directrices, major and minor axes, or axes of symmetry in your graph.

11) Identify the conic section, find the standard form of the equation of the conic, find any vertices, centers, foci, radii, directrices, major and minor axes, axes of symmetry, and graph the equation $16y^2 + 294x + 300 = 128y - 49x^2 + 387$ including the locations of any vertices, centers, foci, directrices, major and minor axes, or axes of symmetry in your graph.

12) If the endpoints of a diameter of a circle are the points (5,–3) and (–7, 5), find the equation of the circle in standard form.

13) If the directrix of a conic section is $y = 8$ and a focus is at the point (–5, 2), what type of conic section is it and find the equation in standard form.

14) If the minor axis is 8, the center is at the point (–2, 1), and a vertex is at the point (–8, 1), what type of conic is it and find the equation of the conic in standard form.

15) If the vertex of a parabola is the point (6,–3) and focus is at the point (1,–3) find the equation of the parabola in standard form.

16) If the endpoints of a diameter of a circle are the points (–6, 1) and (4,–7), find the equation of the circle in standard form.

17) If the major axis is 20, the center is the point (3,–2), and a focus is at the point (–5,–2), what type of conic is it and find the equation of the conic in standard form.

18) Identify the conic section and find its equation, in standard form, based on the following graph if point F is the focus at $(\frac{5}{2}, 5)$ and point P at (–5, 9) is a point on the curve.
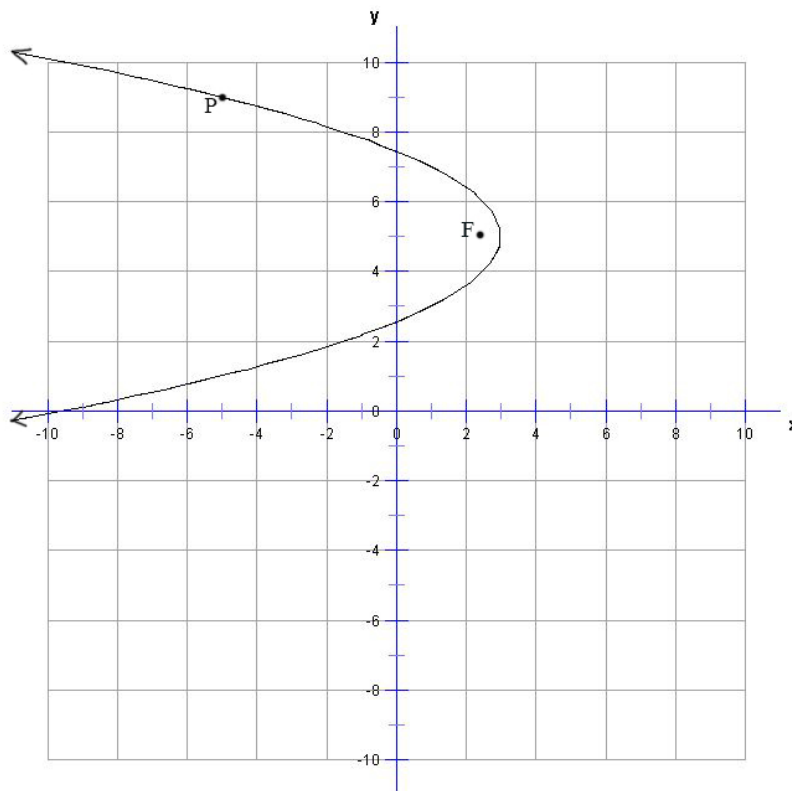
19) Identify the conic section and find its equation, in standard form, based on the following graph if point F is a focus at $(3, 1-\sqrt{39})$, point V at (8, 1) is a vertex, and point C is the center at (3, 1).
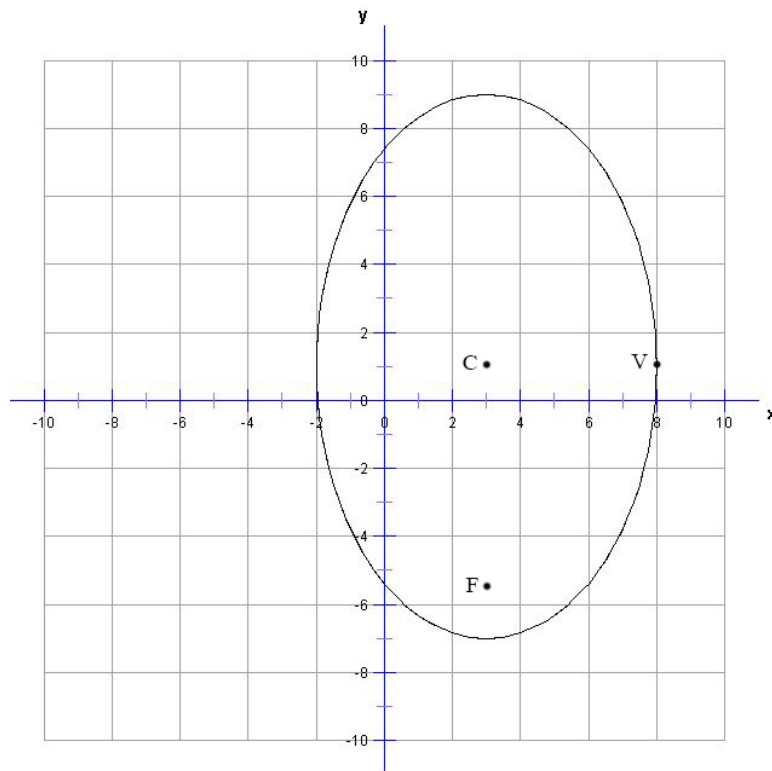
20) Identify the conic section and find its equation, in standard form, based on the following graph, if point C is the center at (–2, 1) and point P at (4, 5) is a point on the curve.