Pre-Calculus Homework #11

1) 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, asymptotes, and graph the equation $36y^2 - 490x - 649 = 1764 + 49x^2 + 288y$ including the locations of any vertices, centers, foci, directrices, major and minor axes, axes of symmetry, or asymptotes in your graph.

2) If a vertex of a conic section is the point (7, –4), a focus is the point $(7, 6 + \sqrt{149})$, and the center is the point (7, 6), what type of conic is it and find the equation of the conic in standard form.

3) Create a graph of the following equations and use it to approximate (rounded to one decimal point) the solutions graphically. Then solve the following system of equations algebraically to find approximate answers (rounded to one decimal place) and see how close your graphical answers are to the real answers.

$$25x^2 + 128y - 156 = 400 + 100x + 16y^2 \quad \text{and} \quad 4x + 8y + 48 = y^2 + 16$$

4) 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, asymptotes, and graph the equation $16 - 5x = 10 + y^2 + 6y$ including the locations of any vertices, centers, foci, directrices, major and minor axes, axes of symmetry, or asymptotes in your graph.

5) If a vertex of a conic section is the point (2, –9), a focus is the point $(9 + \sqrt{33}, -9)$, and the center is the point (9, –9), what type of conic is it and find the equation of the conic in standard form.

6) Convert 210 degrees to radians, convert 57.382 decimal degrees into degrees, minutes, and seconds, convert $\dfrac{3\pi}{4}$ radians into degrees, and convert $219°45'54"$ into decimal degrees.

7) Find the values of the following trigonometric functions. If an answer can be found exactly, you must produce the exact answer, showing all work, without the aid of a calculator, otherwise, round each approximate answer to 4 decimal places:

$$\cos 210°, \quad \sec 57.63°, \quad \tan \frac{5\pi}{6}, \quad \csc 314°35'24"$$

8) Find all the values of θ for each of the following trigonometric equations. If an answer can be found exactly, you must produce the exact answer, showing all work, without the aid of a calculator, otherwise, round each approximate answer to 4 decimal places:

$$\sin \theta = \frac{-\sqrt{2}}{2}, \quad \cot\theta = \frac{3}{5}, \quad \tan \theta = \sqrt{3}, \quad \cos \theta = 4$$

9) Convert 580 degrees to radians, convert 281.74 decimal degrees into degrees, minutes, and seconds, convert $\dfrac{-17\pi}{6}$ radians into degrees, and convert $328°5'33"$ into decimal degrees.

10) Find the values of the following trigonometric functions. If an answer can be found exactly, you must produce the exact answer, showing all work, without the aid of a calculator, otherwise, round each approximate answer to 4 decimal places:

$$\cos\dfrac{15\pi}{4}, \quad \csc 76°37'48", \quad \tan 1470°, \quad \sin 180°$$

11) Find all the values of θ for each of the following trigonometric equations. If an answer can be found exactly, you must produce the exact answer, showing all work, without the aid of a calculator, otherwise, round each approximate answer to 4 decimal places:

$$\csc\theta = \dfrac{2\sqrt{3}}{3}, \quad \sec\theta = -1, \quad \cos\theta = \dfrac{-1}{2}, \quad \cot\theta = \dfrac{-\sqrt{3}}{3}$$

12) Convert -845 degrees to radians, convert 162.28 decimal degrees into degrees, minutes, and seconds, convert $\dfrac{5\pi}{9}$ radians into degrees, and convert $58°22'57"$ into decimal degrees.

13) Find the values of the following trigonometric functions. If an answer can be found exactly, you must produce the exact answer, showing all work, without the aid of a calculator, otherwise, round each approximate answer to 4 decimal places:

$$\sin 270°, \quad \csc 713.864°, \quad \tan\dfrac{\pi}{2}, \quad \cos 167°19'3"$$

14) Find all the values of θ for each of the following trigonometric equations. If an answer can be found exactly, you must produce the exact answer, showing all work, without the aid of a calculator, otherwise, round each approximate answer to 4 decimal places:

$$\csc\theta = \dfrac{-8}{3}, \quad \sec\theta = -2, \quad \sin\theta = \dfrac{-\sqrt{3}}{2}, \quad \cot\theta = 0$$

15) Convert 15 degrees to radians, convert -241.93 decimal degrees into degrees, minutes, and seconds, convert $\dfrac{-13\pi}{6}$ radians into degrees, and convert $746°29'14.1"$ into decimal degrees.

16) Find the values of the following trigonometric functions. If an answer can be found exactly, you must produce the exact answer, showing all work, without the aid of a calculator, otherwise, round each approximate answer to 4 decimal places:

$$\cos(-60°), \quad \cot 85°, \quad \sec\dfrac{-\pi}{4}, \quad \sin(-2970°)$$

17) Find all the values of θ for each of the following trigonometric equations. If an answer can be found exactly, you must produce the exact answer, showing all work, without the aid of a calculator, otherwise, round each approximate answer to 4 decimal places:

$$\cos\theta = 0, \quad \csc\theta = 0, \quad \sec\theta = \dfrac{-2\sqrt{3}}{3}, \quad \tan\theta = undefined$$

18) Convert -1080 degrees to radians, convert 241.361 decimal degrees into degrees, minutes, and seconds, convert $\dfrac{-23\pi}{6}$ radians into degrees, and convert $-174°9'18"$ into decimal degrees.

19) Find the values of the following trigonometric functions. If an answer can be found exactly, you must produce the exact answer, showing all work, without the aid of a calculator, otherwise, round each approximate answer to 4 decimal places:

$$\cot 315°, \quad \sec\frac{3\pi}{2}, \quad \sin(-390), \quad \cos\frac{-13\pi}{4}$$

20) Find all the values of θ for each of the following trigonometric equations. If an answer can be found exactly, you must produce the exact answer, showing all work, without the aid of a calculator, otherwise, round each approximate answer to 4 decimal places:

$$\cot\theta = undefined, \quad \sin\theta = \frac{-\sqrt{2}}{2}, \quad \csc\theta = undefined, \quad \tan\theta = \frac{-1}{3}$$