Week 28 Pre-Calc Assignment:

Day 1: pp. 754-755 #1-45 odd
Day 2: pp. 754-755 #47-55 odd, 65-69 odd, 77-93 odd
Day 3: pp. 762-763 #1-7, odd, 13-17 odd, 21, 27, 33, 39, 41-45 odd
Day 4: pp. 772-774 #1-15 odd, 19-33 odd,
Day 5: pp. 772-774 #35-37 odd, 41-45 odd, 55-59 odd, 69-81 odd

Notes on Assignment:

Pages 754-755:

#17-25: These points have more than one representation in polar coordinates. Remember the quadrant the point is in when determining the values of r and θ. Also, if an angle is not one from the unit circle, calculate the value using the radian mode on your calculator, correct to 4 decimal places.

#27-31: Use the instructions from the overheads.

#33-47: Substitute $x = r\cos\theta$ and $y = r\sin\theta$ and simplify and solve for r.

#33: This is a circle.

#41: Solve for r^2. Then take the square root of both sides. You can leave it in this form, or change everything to sine and cosine and see that sin 2θ is embedded in the right side, as the solutions manual shows.

#43: This is very messy. When you get the substitutions done, you will see that you have a quadratic equation in r. Use the quadratic formula to solve for r.

#45: This is a circle.

#47: Do your substitutions and then factor. Solve by factoring.

#49: Hint: Multiply both sides by r and see if you can make any substitutions.

#51: Hint: Take the tangent of both sides.

#53: Hint: Square both sides.

#55: Hint: Write in terms of sine instead of cosecant and clear the fractions.

Pages 762-763:

#1-5: Use the descriptions of the graphs on page 760 to describe these.

#7: You can use the quick tests for these, but must also check for the other symmetries using the tests. Put in the given point for the particular symmetry, and then see if the equation can be simplified to match the original equation.

#13-15: You know that the greatest value of sine or cosine is always 1, and the smallest is always -1. To find the max value for r in your equation, figure out what angle you must put in for θ so that the right side of your equation is the largest value possible. (The value can be positive or negative, because we know that r is a directed distance. The negative just tells us which direction to go, not the length of r.) To find the zeros, you need to find the value of θ that makes r = 0. Take your equation, put 0 in for r, and figure out what θ must be.

#17-33: Try and sketch these on your own, and then check with your calculator.

#17, 21: These are circles.

#27: Using the examples on page 760, decide which kind it is, based on the value of a/b. Use the quick test to find the symmetry. Then find your maximum value and zero and sketch the graph.

#33: This is a rose curve. Determine the number of petals.

#39: This is a lemniscate. Graph accordingly, using the examples on page 760.

#41-45: Make sure you are in Polar mode. Use [ZOOM] [ZoomFit] to adjust windows.

Pages 772-774:

#1-3: Remember that the inclination of the line is the angle that the line makes with the x-axis, measured counter-clockwise. Its relationship to slope is that m = tan θ. Put the value of the slope into the equation and solve for θ. If it is not a value from the unit circle, use your $\tan^{-1}$ function on your calculator. Your answers can be in radians or degrees.

#5-7: Use the formula on page 701 and do these similarly to the way you did #1-3. You should get an acute angle. Your answers can be in radians or degrees.

#9: Use the formula on page 702.

#13-15: Graph the given information and decide which standard equation you will use. Find the value of p and write your equation.

#19: First find the equation of the parabola. Write your standard form and plug in the value for the vertex and then one of the other points. You can then solve for p. Put in your value for p and the vertex and you will have your equation. For the answer to the problem, you need to find the x-coordinate when y = 0. Let y = 0 and solve.

#21-23: Graph the given information and decide which standard equation you will use. Use $c^2 = a^2 - b^2$ to find any missing amounts for your equation.

#25: Sketch the picture first and then find c to find out where to place the foci.

#29: This is a double-completing-the-square. Be careful!

#31-33: Graph the given information and decide which standard equation you will use. Use $c^2 = a^2 + b^2$ to find any missing amounts for your equation. Draw your box and then your asymptotes. Sketch the graph.

#33: Using the asymptote information, you know that b/a = 2. Solve for b to get b = 2a. Put that in for b in the equation $c^2 = a^2 + b^2$ along with the value for c, which you can figure out from the information given. Solve this for a. Then put that back into b = 2a to find out what b is. Put these values into your equation.

#35-37: It will be helpful to sketch the graph first.

#37: This is a double-completing-the-square. Be careful, especially pulling out the negative!

#41: Check the values of A and C, according to the box on the top of page 731.

#43-45: First find the angle of rotation by solving $\cot 2\theta = \dfrac{A - C}{B}$. Then substitute your angle into the equations $x = x' \cos \theta - y' \sin \theta$ and $y = x' \sin \theta + y' \cos \theta$. Substitute these amounts into your original equation for x and y. Write the new equation in standard form for whatever conic it is. Then graph the conic using the rotated axes.

#55: Since there are no restrictions on t, you can let t = any number. As you do this, you will discover the general shape of the graph. To find the equation in rectangular form, solve one of the equations for t and then substitute for t in the 2nd equation. To find the orientation, see what direction the graph travels as t increases.

#57: There are no restrictions on t, but you should notice that x will always be positive because t is squared. To eliminate the parameter, solve the 2nd equation for t and then substitute into the first equation.

#59: Solve each equation for the trig function. Then use the fact that $\sin^2\theta + \cos^2\theta = 1$ and substitute.

#69-71: Do not use the conversion feature on your calculator. Substitute the values into $x = r\cos\theta$ and $y = r\sin\theta$ to find x and y.

#73-75: Do not use the conversion feature on your calculator. Use $\tan\theta = \frac{y}{x}$ and $r^2 = x^2 + y^2$. Be careful that you pay attention to the quadrant that the point lies in. There is more than one correct answer for these.

#77: Use any of the equations listed above for problems #69-75. Make substitutions to eliminate x and y. For your final answer, you need to solve your equation for r.

#79: After doing your substituting for x and y, you should solve for r^2. Your denominator is almost sin 2θ. Multiply by 2/2 and you will have what you need in the denominator to write it as sin 2θ. You can then change that to cosecant to get the answer given in the solution.

#81: Hint: multiply both sides by r.