National Convention 2014 Theta Ciphering Solutions

Question #0-

Question #1-

Question #2-



Question #3-



Question #4-

Question #5-Based on the position of the foci, the center is the origin so h and k are irrelevant.

a/b is the slopes of the asymptotes which is 2, so a =2b

 therefore;



Question #6

Question #7-Don't plug it in!! Too annoying. Use synthetic division to simplify and then it is an easy question. Ignore the remainder since you are rounding to nearest integer, it will be zero.

Question #8-Draw yourself a picture when doing geometry problems. The area of a rhombus is one-half the product of the diagonals: . The diagonals in a rhombus bisect each other and intersect at a right angle. From this information we can find that the side of the rhombus has length 10.

. The height of the rhombus is the diameter of the circle. The circumference is just

Question #9-- Draw picture!! Extend the larger radius out 5 units at the tangent point and then create a rectangle to the center of the smaller circle. This creates a right triangle where the distance from the centers is the hypotenuse, one side is now 11 and the other side is equivalent to the common internal tangent we are trying to solve for. 

Question #10-Isolate your best friend zero and don't cross multiply.



. Your critical numbers are -1, 2, and 4. this creates test regions. Answer is:



answers:

1-15625

2-14

3-

4-26

5-15

6-

7-4029

8-

9-

10-