0) What is the period of the function $f(x) = \cos^4 x - \sin^4 x$?

1) Find the sum of the solutions to: $k^{k\sqrt{k}} = \left(k\sqrt{k}\right)^k$.

2) Find all the solutions for the equation: $\dfrac{\cos x - 1}{-\sin x} - 1 = 0$ over the domain: $0 < x < 2\pi$

3) Mr. Lu's urn contains some black marbles and exactly 4 gold marbles. The probability of selecting a gold marble is L%. If the number of black marbles is doubled, the probability of selecting one of the 4 gold marbles drops to (L-15)%. What does L=?

4) Find the measure of the angle, in degrees, between the vectors $\langle 2,1 \rangle$ and $\langle -2-\sqrt{3}, -1+2\sqrt{3} \rangle$.

5) If z is a complex number that satisfies $2 + 8i = z + |z|$, what does $|z|$ =?

6) How many solutions does the equation: $\cos(32x) + \cos(16x) = 0$ have for $0 \le x < 2\pi$?

7) L and U are two points on a circle with center K, and Z lies outside the circle, on ray $\overrightarrow{LU}$. Given LU=24, UZ=28, and KL=15, find KZ.

8) Find the slope of the perpendicular bisector of the line segment joining the foci of the graphs of $y^2 = 4x$ and $x^2 - 6x - 8y - 31 = 0$.

9) The fifth term of an arithmetic sequence is 4 and the nth term is 104, where n>5. How many possible values are there for n if the common difference is an integer?

10) If the coefficient of the 4th and 10th terms in the expansion of $(M-U)^n$ are equal, what is the coefficient of the 8th term?

11) Find <u>all</u> ordered pair solutions for the following system of equations: h + k = 6 and $h^{k^2-7k+12} = 1$. What is the sum of the values of h?

12) Evaluate the determinant: $\begin{vmatrix} 3 & 4 & -2 & 1 \\ 3 & 1 & 0 & -3 \\ 0 & -3 & 2 & 3 \\ 2 & -1 & 0 & -4 \end{vmatrix}$