Alpha Ciphering Questions

P What is the length of the segment of the line y + 7x = 26 which lies inside the circle $x^2 + y^2 - 2y = 24$?

1. The equation $x^6 + 5x^5 + 5x^4 - 7x^3 - 9x^2 + 3x + 2 = 0$ has 2 rational roots and 4 irrational roots. Find the sum of the irrational roots.

2. Solve for x: $\sum_{r=0}^{4} \binom{4}{r} 5^{4-r} x^r = 64$

3. The equation $5^x + \frac{10}{5^x} = 7$ has x=1 as a solution. Find another exact solution.

4. If Cos (9x) – Cos (7x) = 0, find the number of solutions for x, where $0 < x \le \frac{\pi}{2}$.

5. What is the coefficient of x^2 in the expansion of $\left(4x^2 + \frac{1}{2x}\right)^7$?

6. What expression must be used in order to rationalize the denominator in $\frac{1}{3 - \sqrt[3]{2}}$?

7. If $N^{\log_2 3} = 8$, what is $N^{(\log_2 3)^2}$?

8. Find the slope(s) of the line(s) formed when graphing y = |2x - 4| + |4 - x| ?

9. Find x if $\sqrt{5 + 2\sqrt{6}} - \sqrt{5 - 2\sqrt{6}} = x\sqrt{x}$.

10. Solve $x^4 - x^3 - 19x^2 + 49x - 30 < 0$. State your final answer in interval notation.