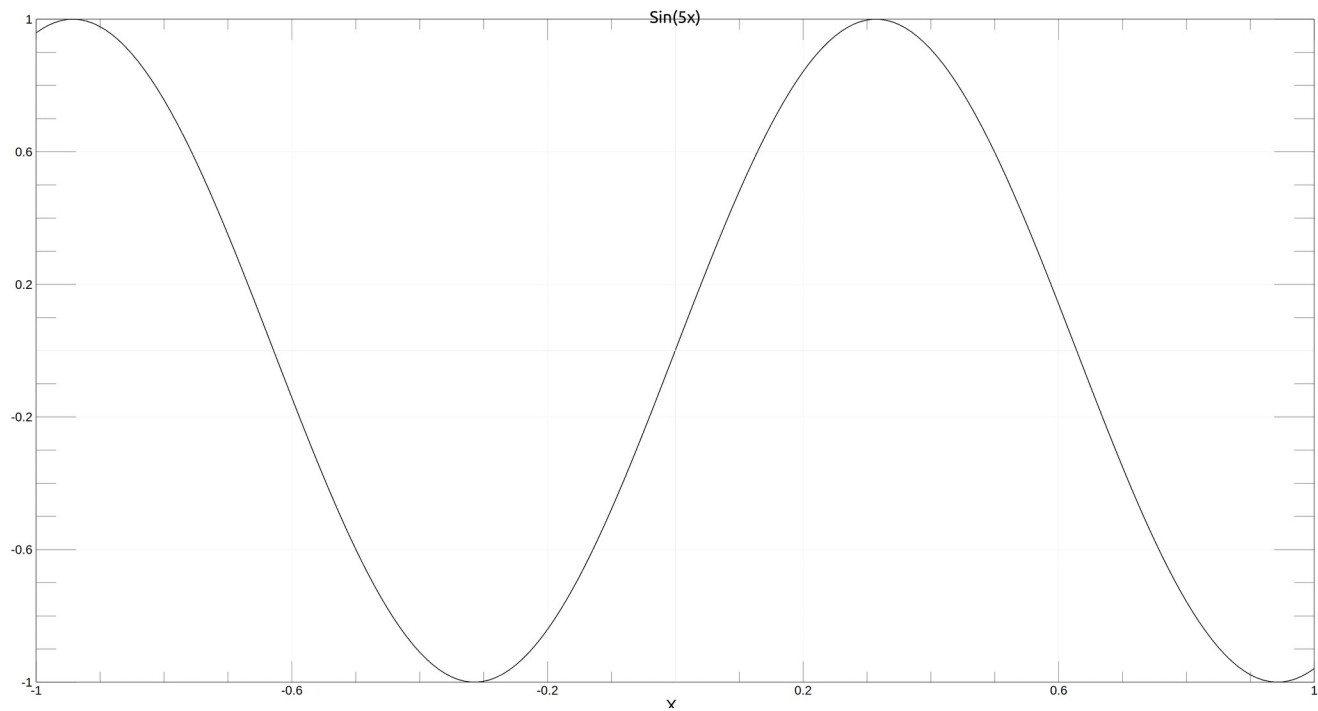
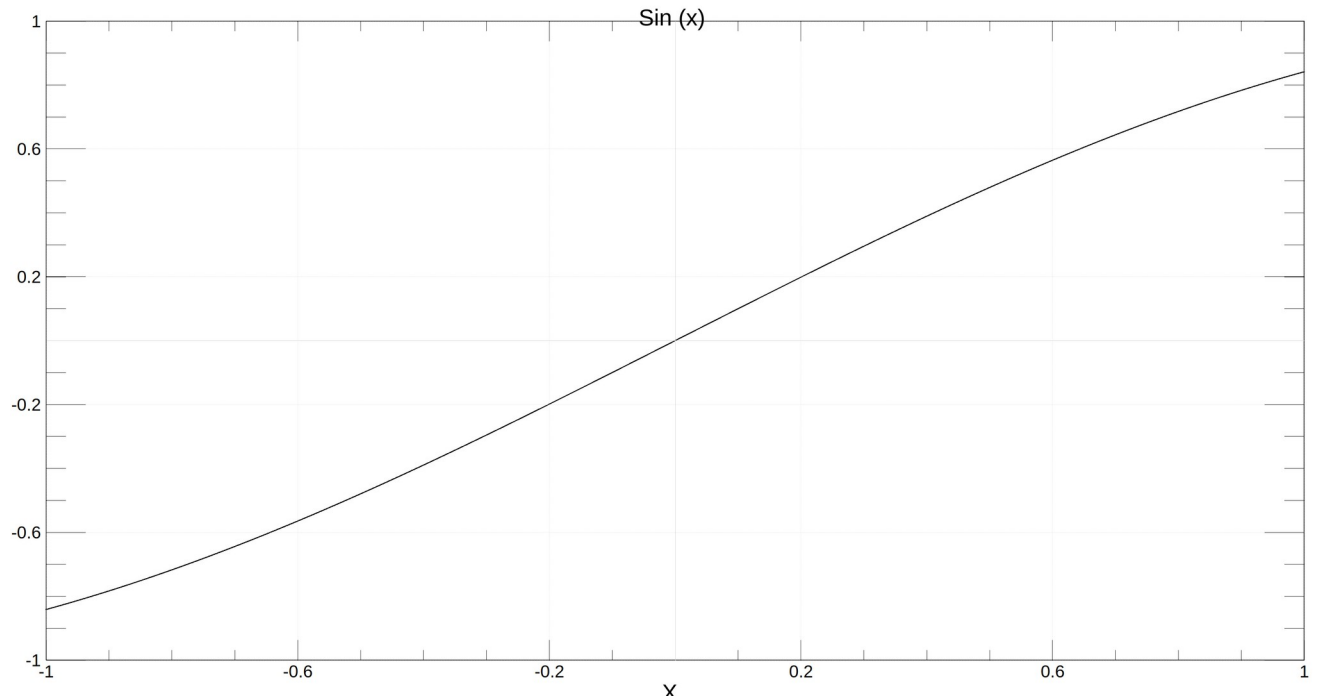
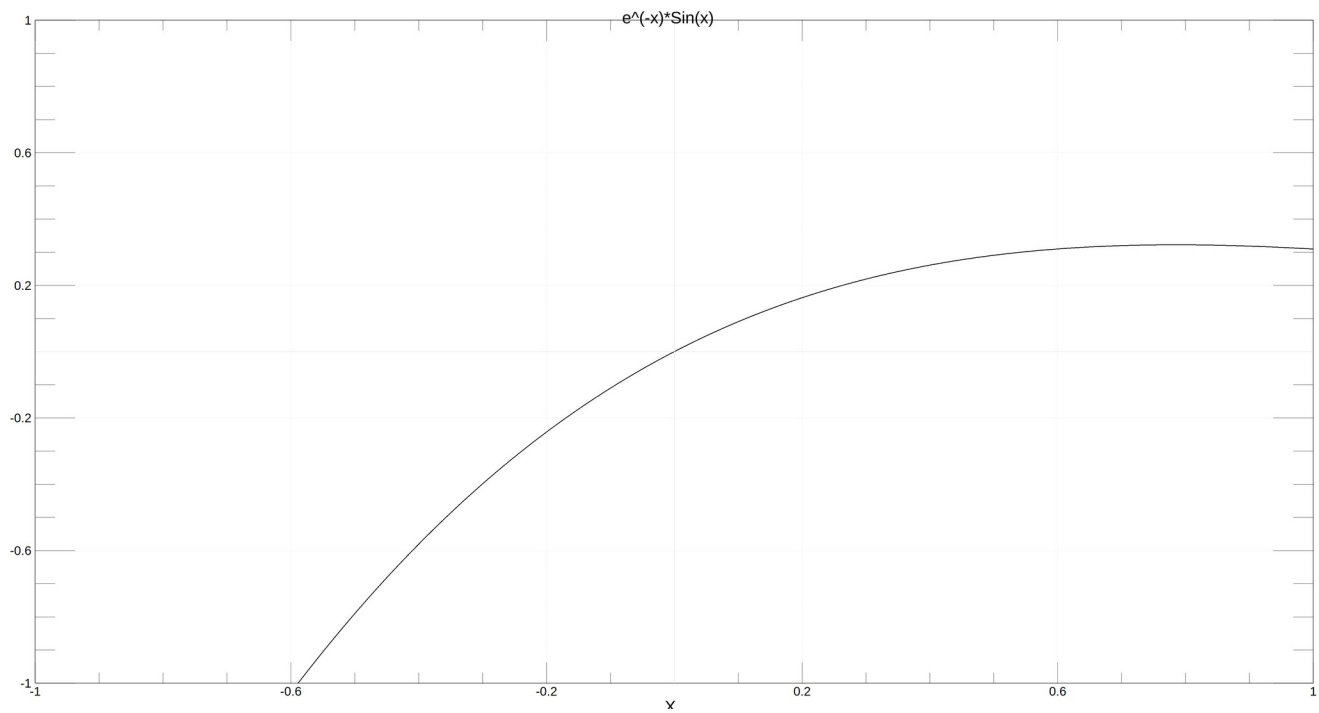
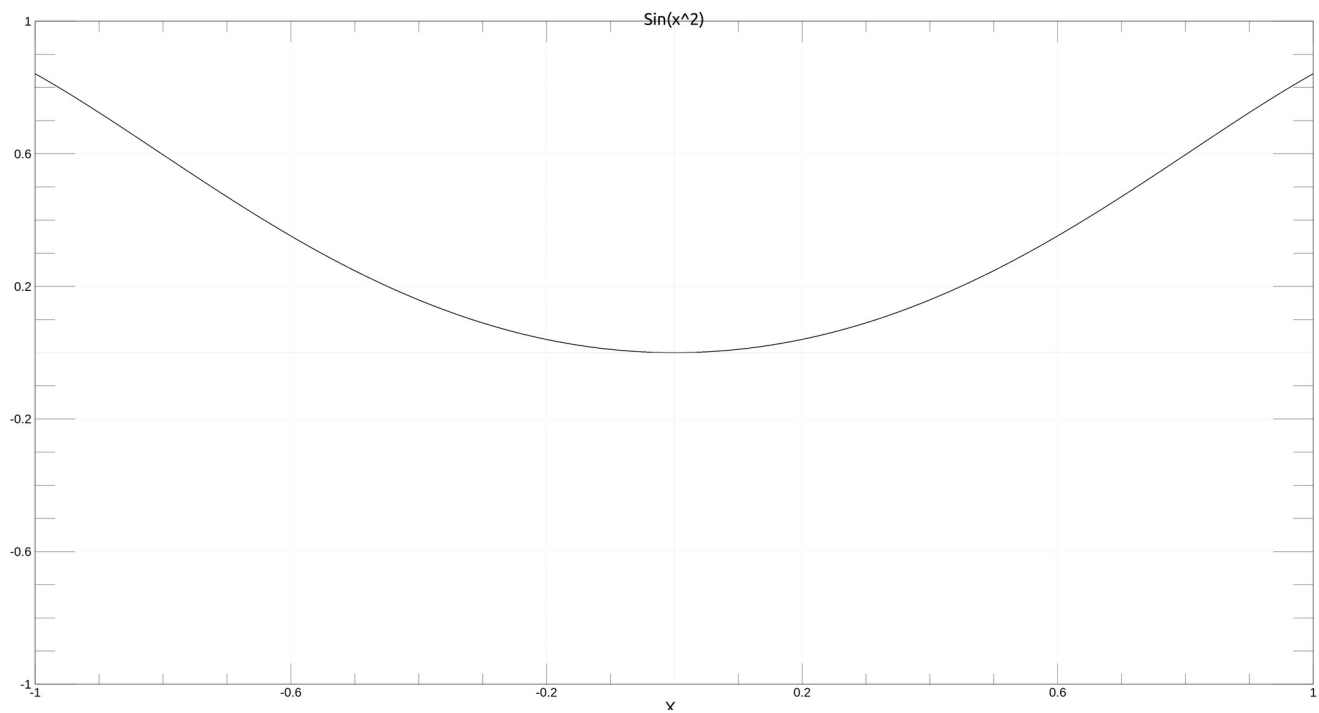


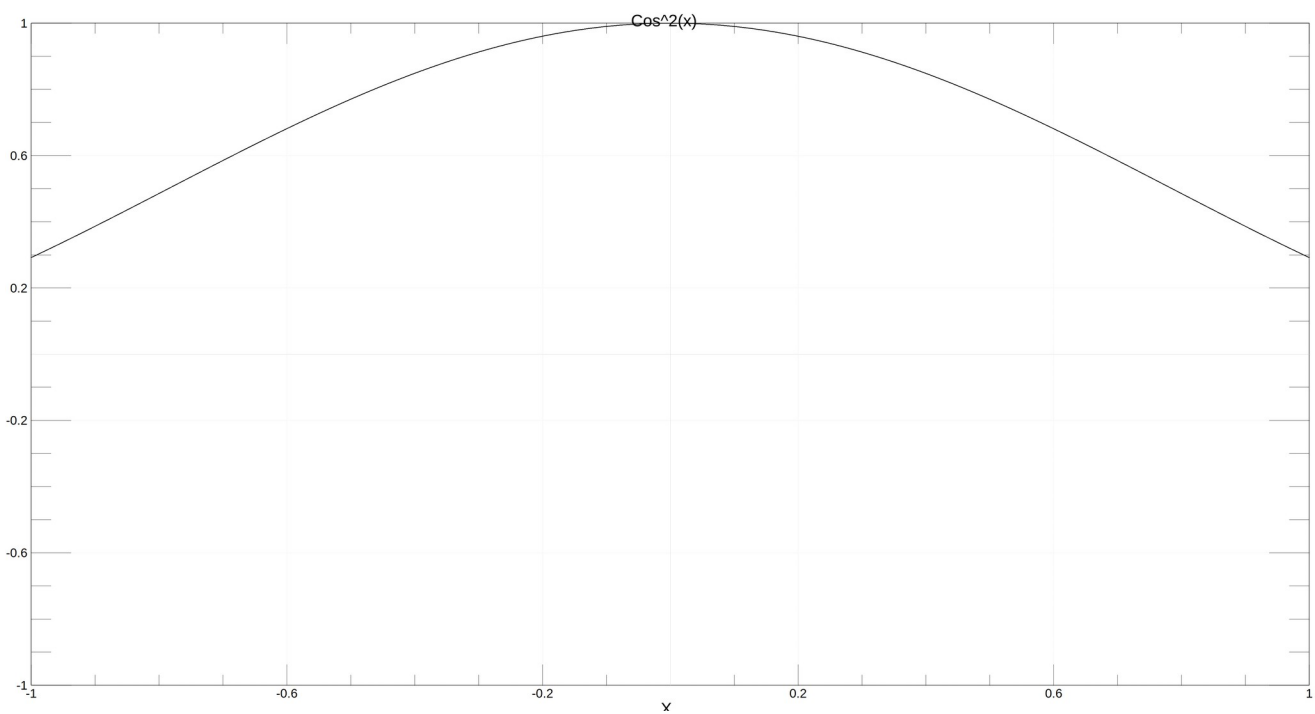
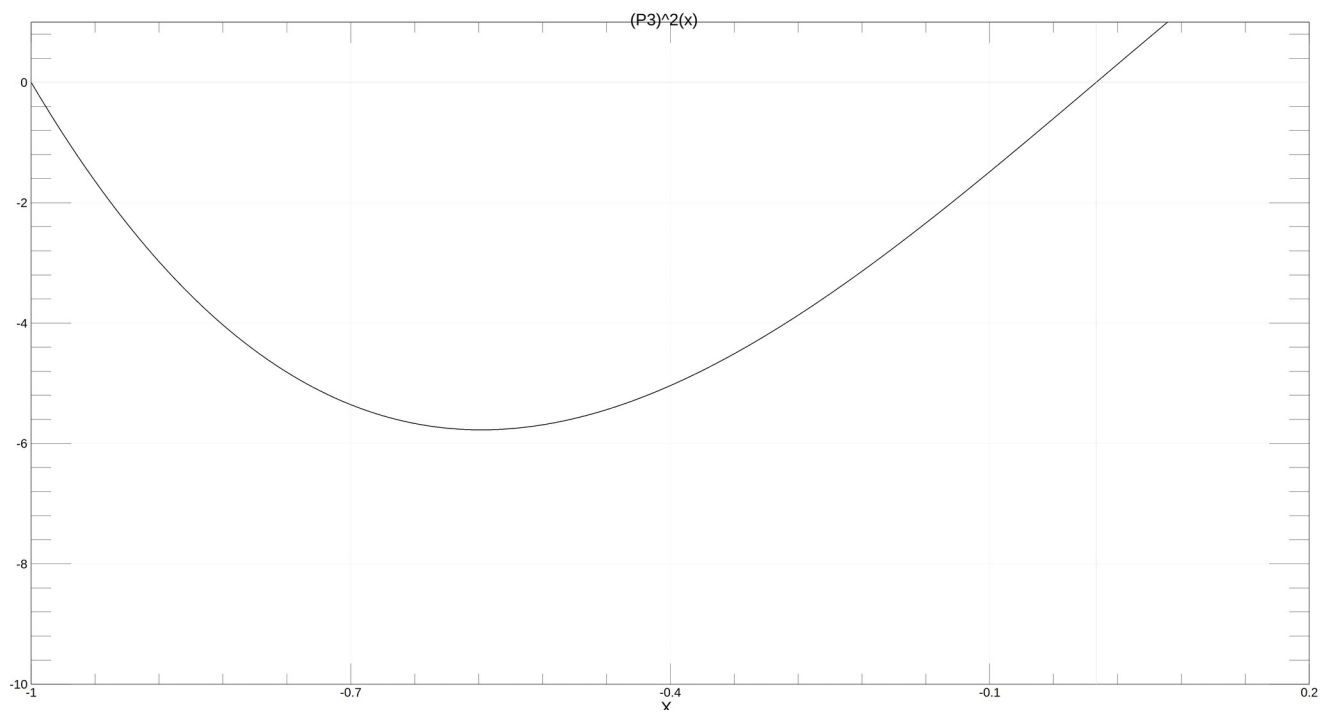
Assignment-3

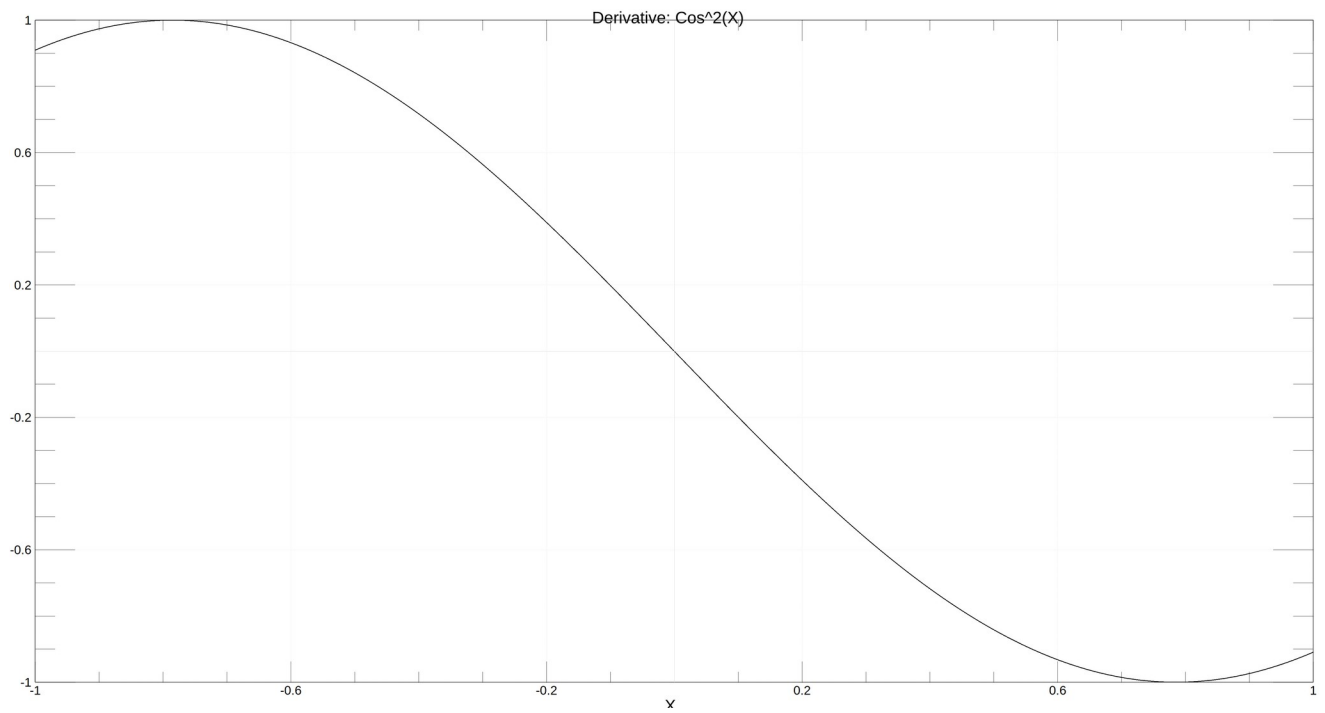
1. Using both the methods of vectors and determinants, the volume of the of the crystal comes out to be 9 Units.

2. As per the question, the various plots plotted are given below:

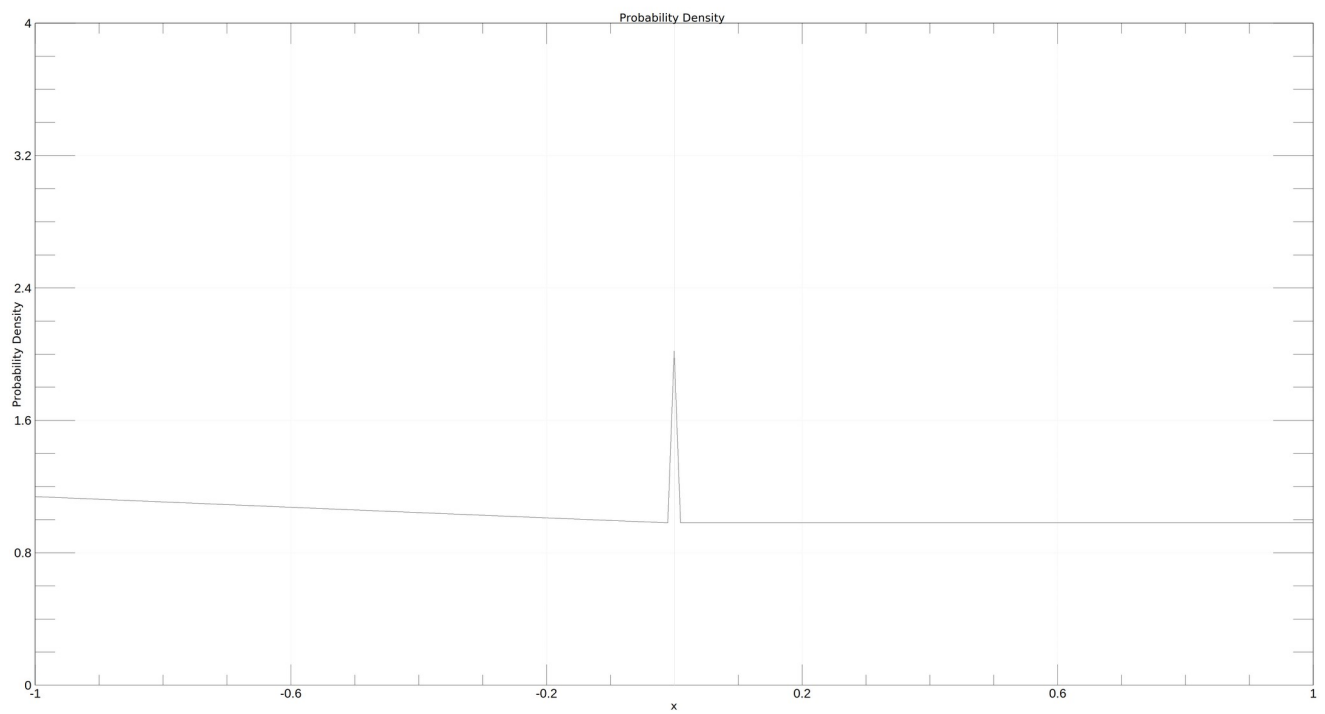








6. Probability density function for $ka=0.2$ and $V/E=0.5$ is obtained as:

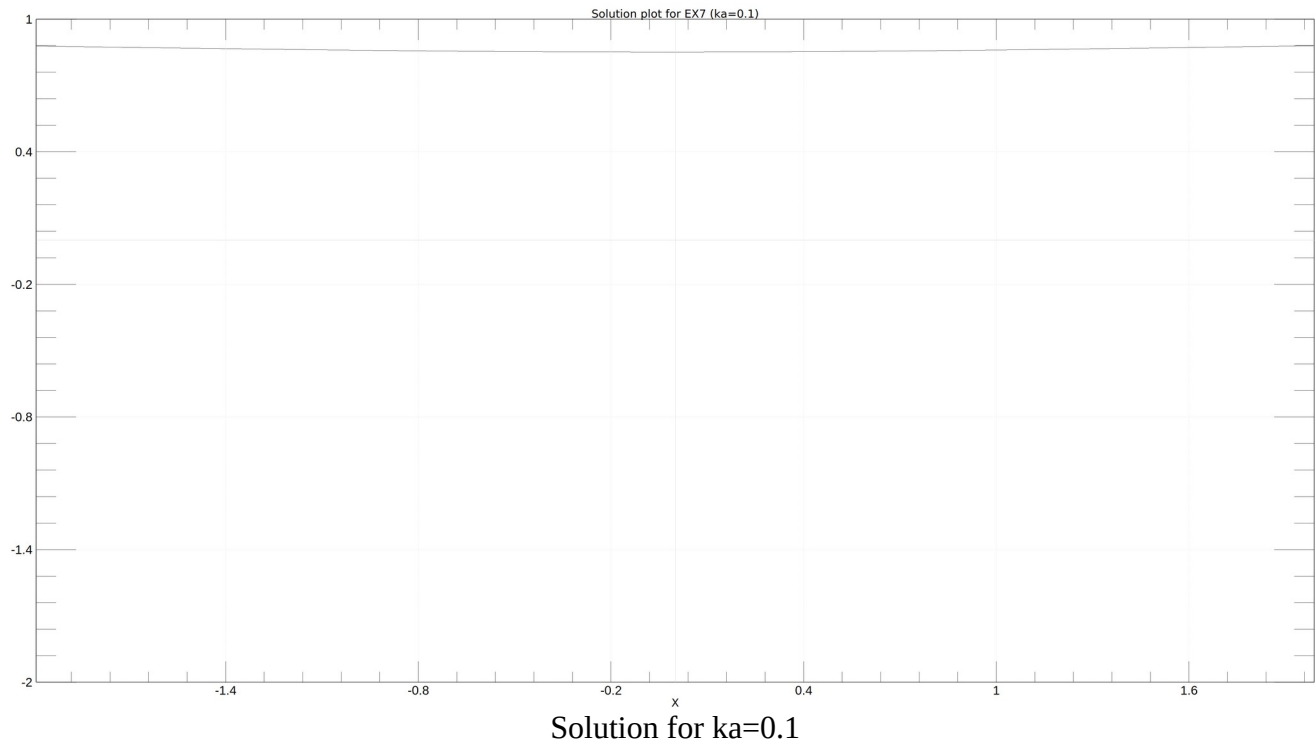


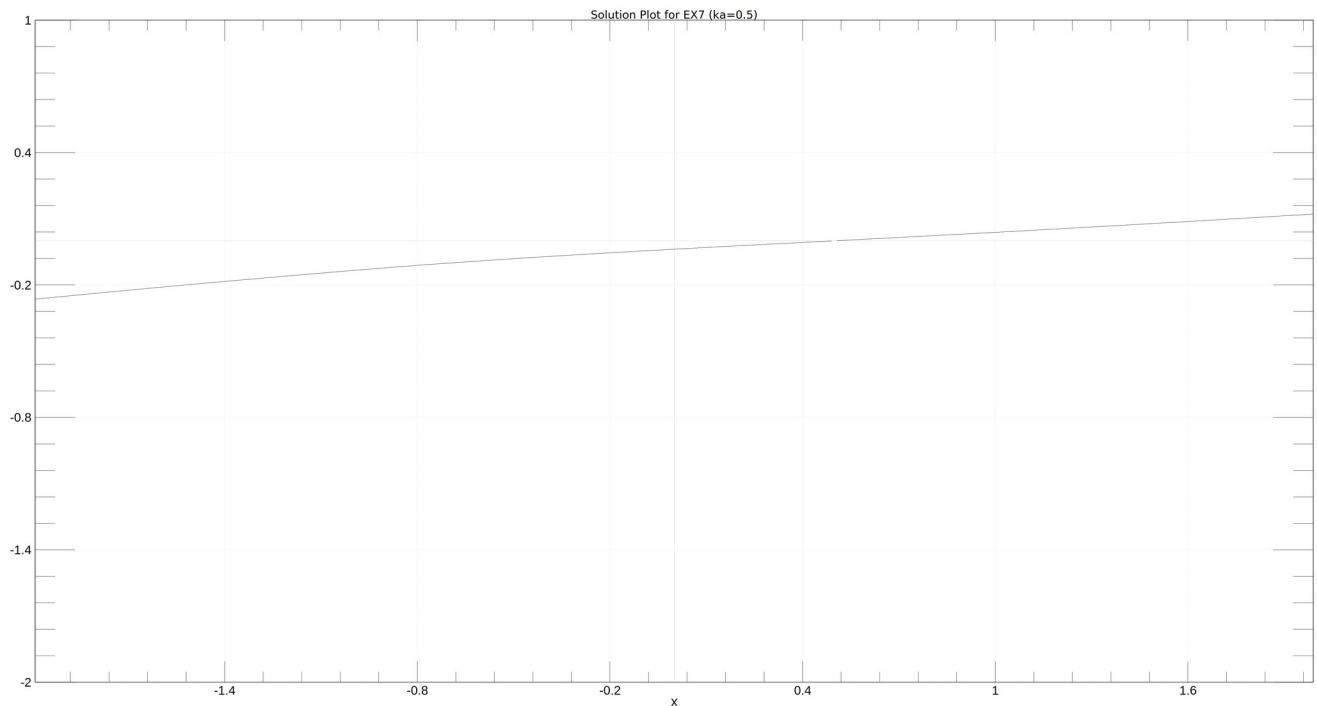
7. Values of Reflection Coefficients and Transmission Coefficients were obtained for corresponding values of V/E and Ka

S. No.	V/E	Ka	Reflection Coeff. (R)	Transmission Coeff. (T)
1	0.5	0.1	-0.022, i0.146	0.97765, -i0.1495
2	1	0.2	-0.3072, -i0.439	0.691, -0.483i
3	1.5	0.3	-0.824, -0.280i	0.158, -0.465i

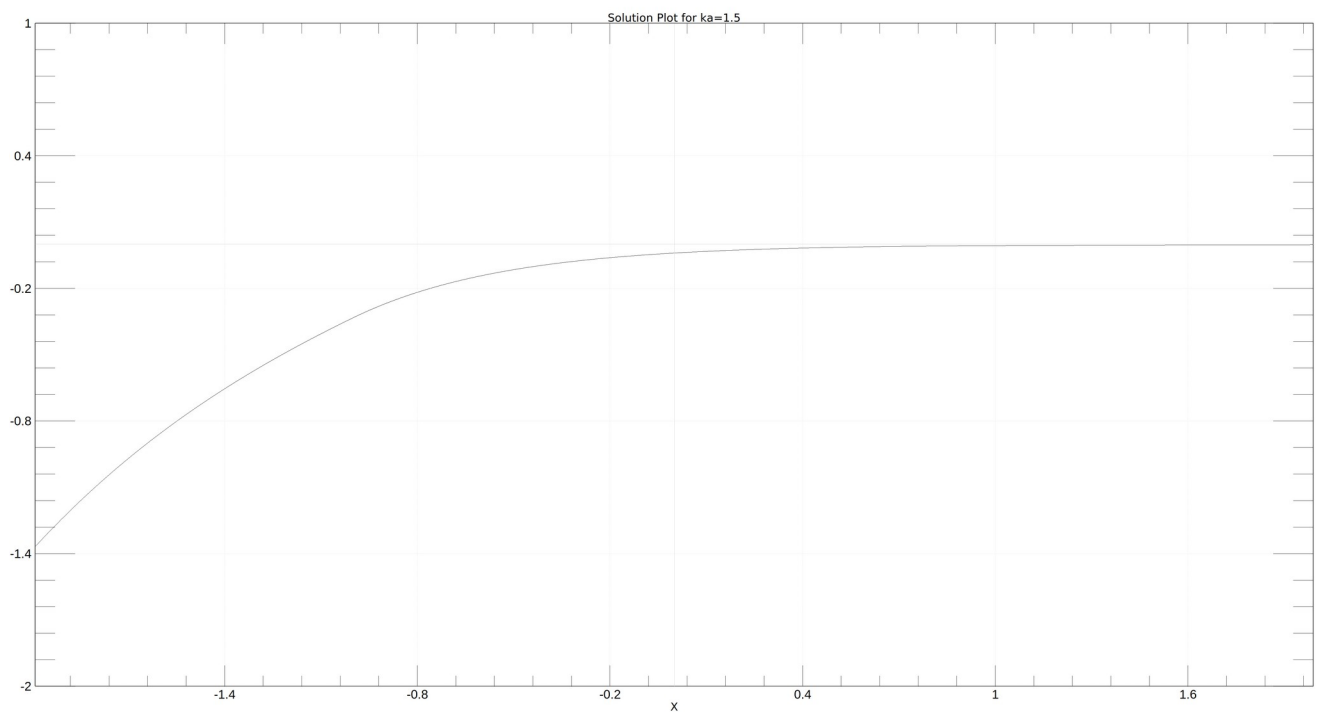
For a sanity check, the sum of the norms of the coefficients was always 1.

8. For the sake of plotting, only the real part of the final solution is depicted. $V/E=1.5$ in all cases





Solution plot for $ka=0.5$



Solution plot for $ka=1.5$

9. I was able to write the code for $n=0$ and $n=1$. But I was not able to get the desired plot. I am unsure about the exact expectation from the solution of the problem.