Q1)

Best fit curve for a given set of points

Legend:
- $14.07-23.84x+14.34x^2-2.42x^3-0.2x^4+0.06x^5$
- given points

x-axis: x
y-axis: f(x)

Q2)

best fit polynomial

Legend:
- $1.0+0.98x-0.43x^2-0.25x^3+0.1x^4-0.01x^5$
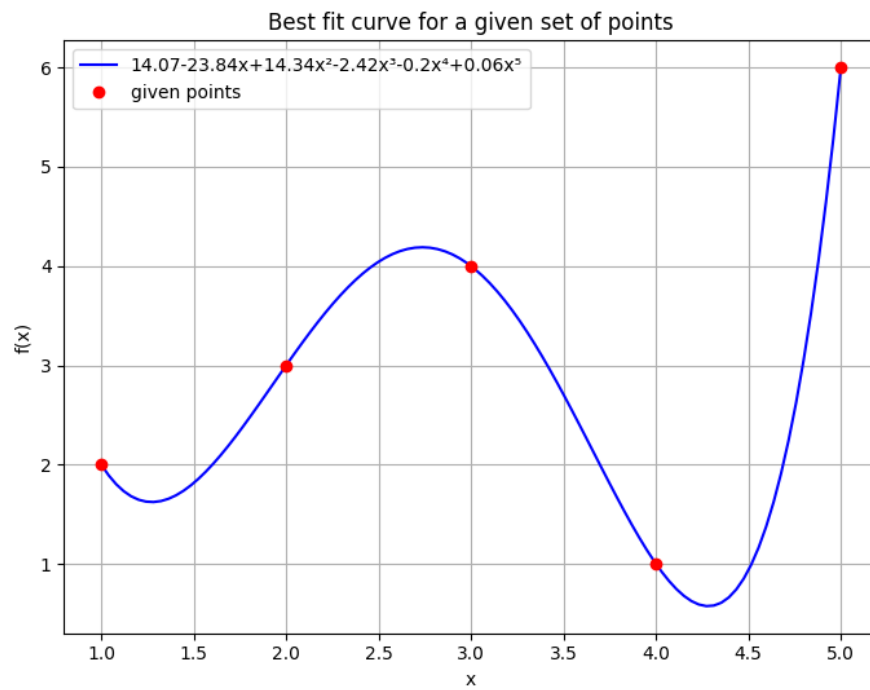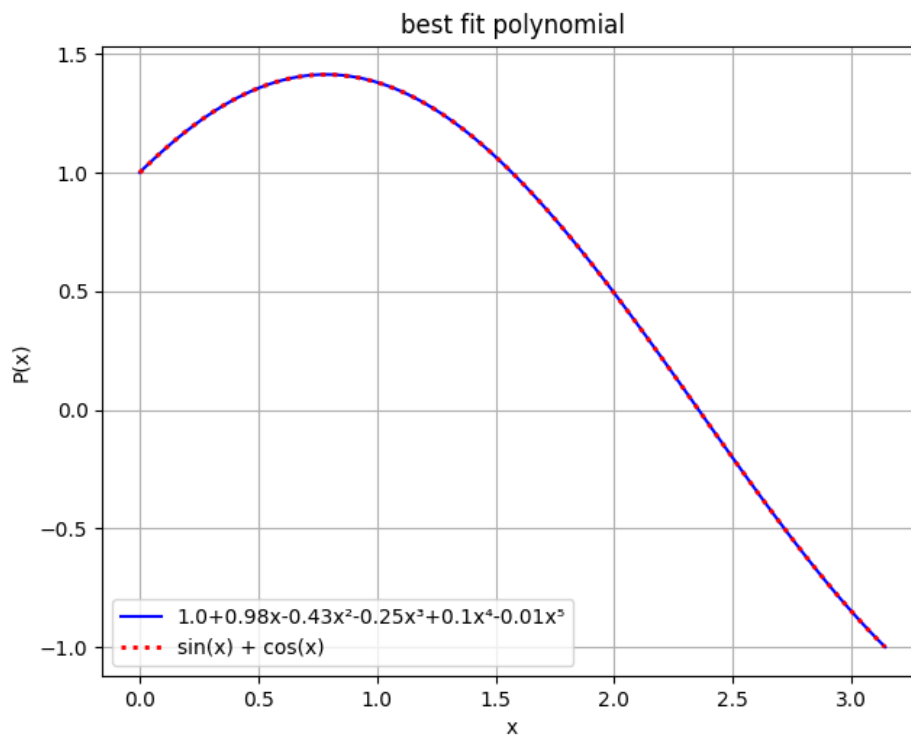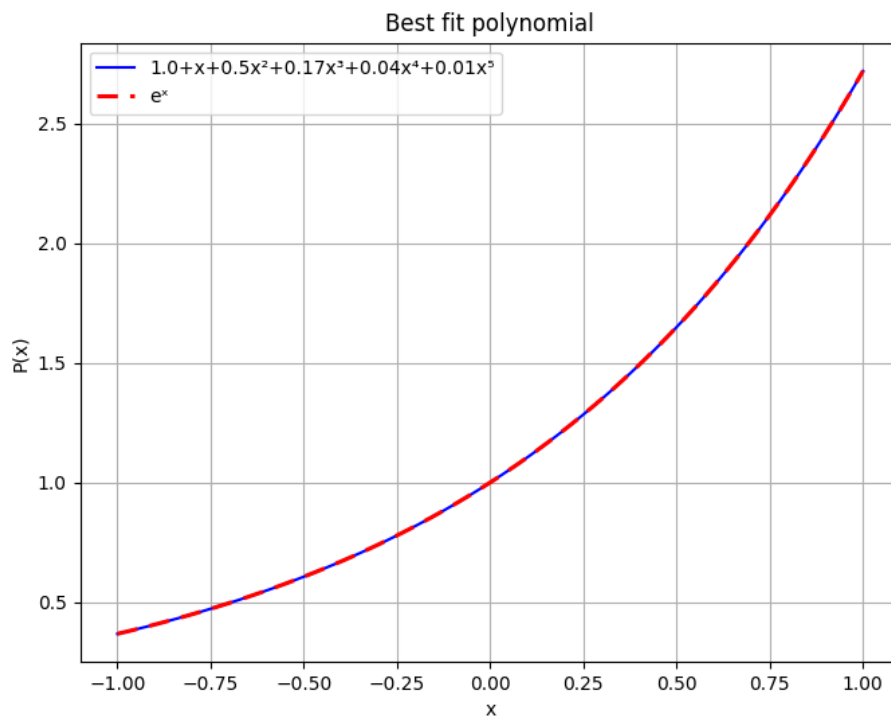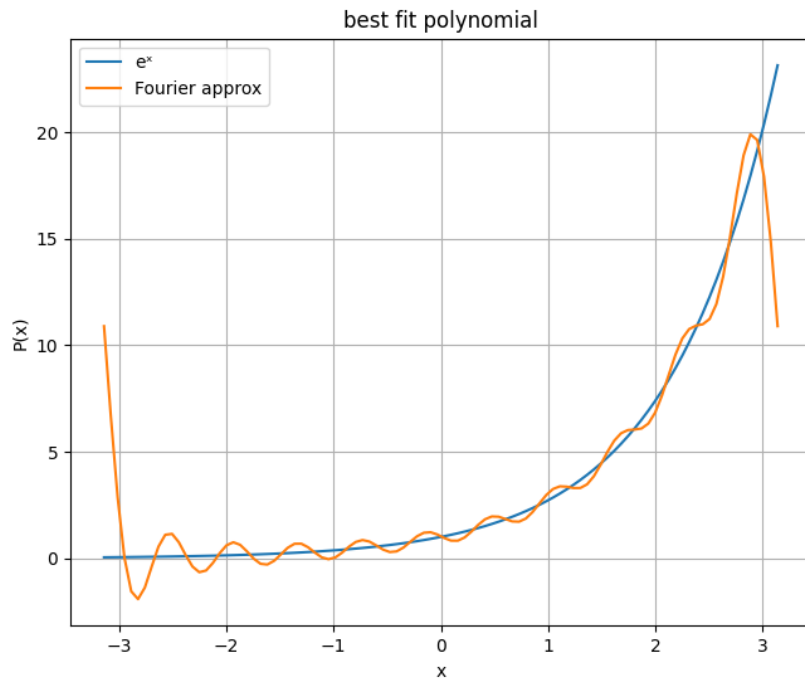- $\sin(x) + \cos(x)$

x-axis: x
y-axis: P(x)

Q4)

Q6)

```
[(0, 0), 3.14]
[(0, 1), 0]
[(0, 2), 0]
[(0, 3), 0]
[(0, 4), 0]
[(1, 0), 0]
[(1, 1), 1.57]
[(1, 2), 0]
[(1, 3), 0]
[(1, 4), 0]
[(2, 0), 0]
[(2, 1), 0]
[(2, 2), 1.57]
[(2, 3), 0]
[(2, 4), 0]
[(3, 0), 0]
[(3, 1), 0]
[(3, 2), 0]
[(3, 3), 1.57]
[(3, 4), 0]
[(4, 0), 0]
[(4, 1), 0]
[(4, 2), 0]
[(4, 3), 0]
[(4, 4), 1.57]
```
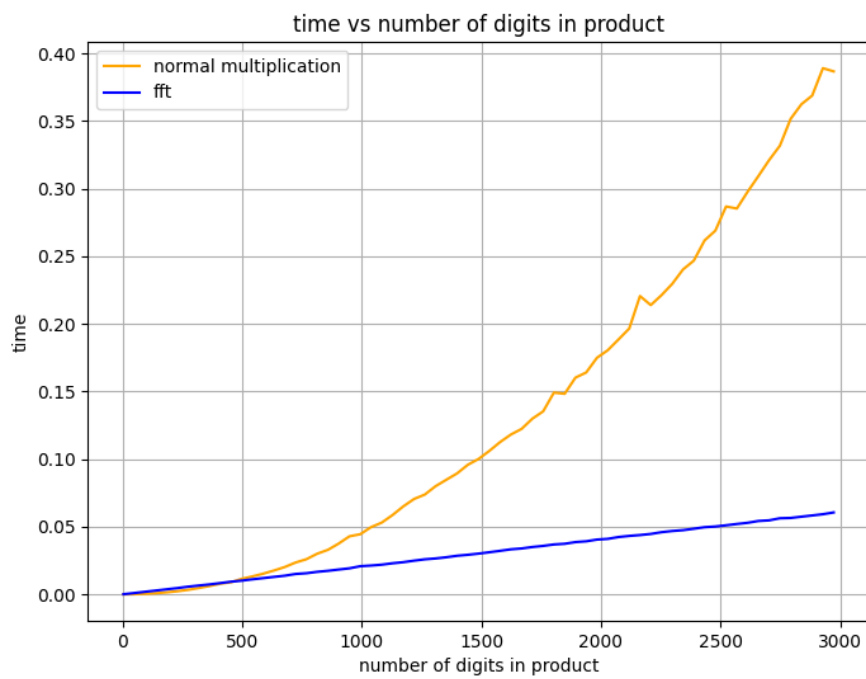
considering zero base indexing, result is 0 for all i,j such that
i!=j, and result is positive real number for all i,j such that i=j.
hence they are orthogonal

Q7)

best fit polynomial

Q8)

assuming input numbers are in the form of string and non negative.

time vs number of digits in product

assuming that multiplyUsingFFT function after ifft takes (2 * (len(res1) / 100000)) seconds
for finding final product.
here 100000 is no of iterations per second cpu can do.