Lab2 Result

Part 1.1

results
0.7390851781060102

Part 1.2

results
0.588532742847979

Part 2.1

results
0.5671431650348622

Part 2.2

results
0.5666057041281578

Part 3.1

results
0.9324695142
0.6612093865
0.2386191861
-0.9324695142
-0.6612093865
-0.2386191861

LegendrePolynomial

$$P_0(x) = 1$$

$$P_1(x) = x$$

$$P_2(x) = -\frac{1}{2} + \frac{3}{2}x^2$$

$$P_3(x) = -\frac{3}{2}x + \frac{5}{2}x^3$$

$$P_4(x) = \frac{3}{8} - \frac{15}{4}x^2 + \frac{35}{8}x^4$$

$$P_5(x) = \frac{15}{8}x - \frac{35}{4}x^3 + \frac{63}{8}x^5$$

$$P_6(x) = -\frac{5}{16} + \frac{105}{16}x^2 - \frac{315}{16}x^4 + \frac{231}{16}x^6$$

Part 3.2

results
0.965925826319969
0.7071067836382328
0.25881919883774857
Failed: 0
-0.25881919883774857
-0.7071067836382328
-0.965925826319969

ChebyshevPolynomial

$$T_0(x) = 1$$

$$T_1(x) = x$$

$$T_2(x) = -1 + 2x^2$$

$$T_3(x) = -3x + 4x^3$$

$$T_4(x) = 1 - 8x^2 + 8x^4$$

$$T_5(x) = 5x - 20x^3 + 16x^5$$

$$T_6(x) = -1 + 18x^2 - 48x^4 + 32x^6$$

Part 3.3

results
0.2228466041792607
1.1889321016836514
2.992736326071531
5.775143569198582
9.837467418382552

LaguerrePolynomial

$$L_0(x) = 1$$

$$L_1(x) = 1 - 1x$$

$$L_2(x) = 2 - 4x + x^2$$

$$L_3(x) = 6 - 18x + 9x^2 - 1x^3$$

$$L_4(x) = 24 - 96x + 72x^2 - 16x^3 + x^4$$

$$L_5(x) = 120 - 600x + 600x^2 - 200x^3 + 25x^4 - 1x^5$$

$$L_6(x) = 720 - 4320x + 5400x^2 - 2400x^3 + 450x^4 - 36x^5 + x^6$$

Part 3.4

results
2.3506049737
1.335849074
0.4360774119
-2.3506049737
-1.335849074
-0.4360774119

HermitePolynomial

$$H_0(x) = 1$$

$$H_1(x) = 2x$$

$$H_2(x) = -2 + 4x^2$$

$$H_3(x) = -12x + 8x^3$$

$$H_4(x) = 12 - 48x^2 + 16x^4$$

$$H_5(x) = 120x - 160x^3 + 32x^5$$

$$H_6(x) = -120 + 720x^2 - 480x^4 + 64x^6$$