目录

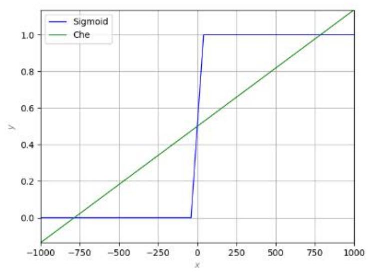
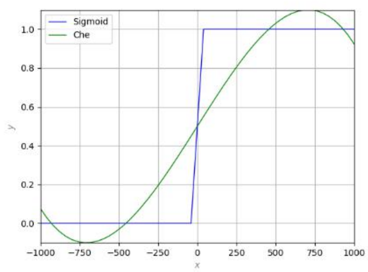
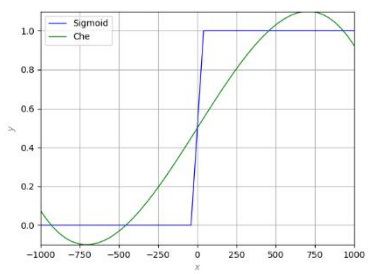
被逼近函数为 sigmoid,$f(x)=\frac{1}{1+e^{-x}}=\frac{1+tanh\frac{x}{2}}{2}$

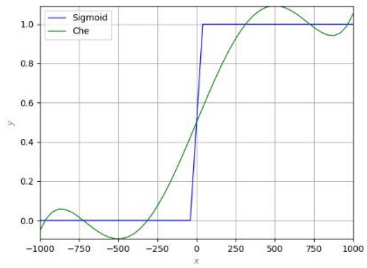
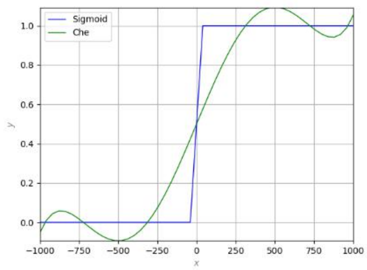
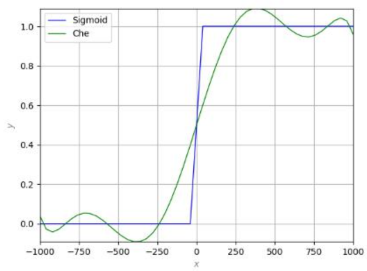
12 为切比雪夫逼近，权函数为$\rho(x)=\frac{1}{l\sqrt{1-(x/l)^2}}$

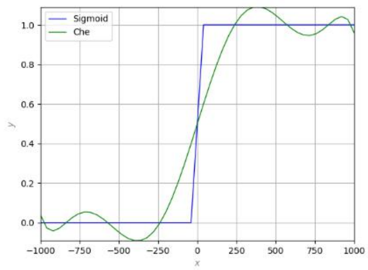
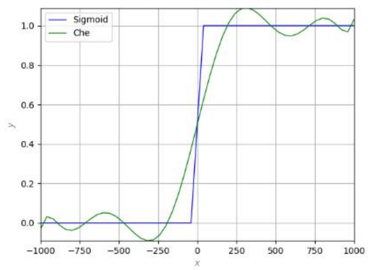
34 为切比雪夫逼近，权函数为$\rho(x)=e^{-(l/x)^2}$

56 为勒让德逼近，权函数为$\rho(x)=1$

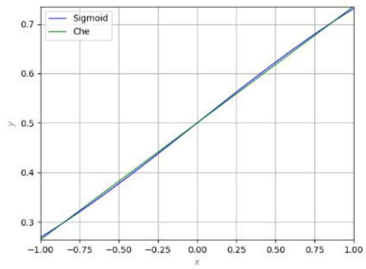
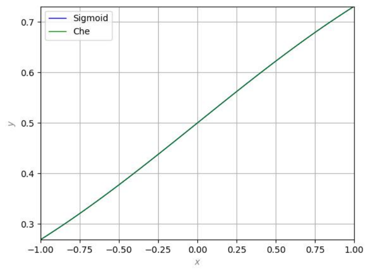
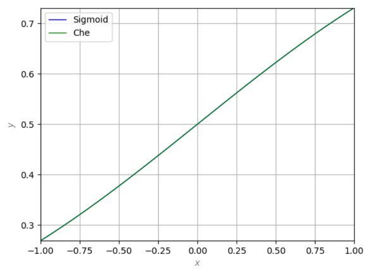
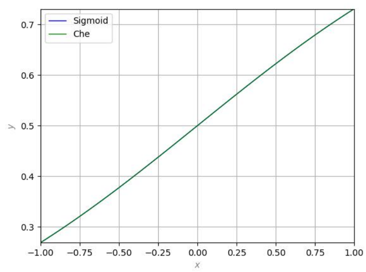
1.基底:$\frac{1}{10^3\sqrt{1-(\frac{x}{10^3})^2}}$ 区间:[-10^3,10^3]

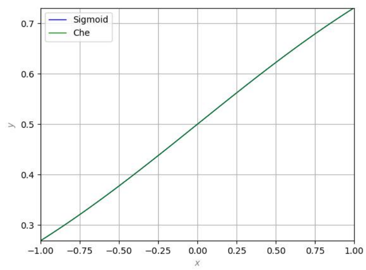
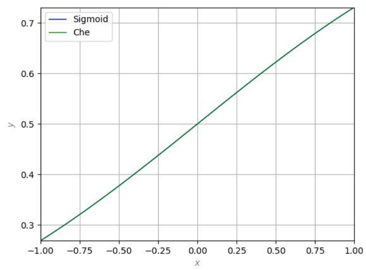
Degree	Polynomial Approximations	Sigmoid function, p(x)
2	p(x)= -2.88009325106496e-20*x**2 + 0.000636618725167192*x + 0.500000000000003 $\|\|f(x)-p(x)\|\|_2$=0.384422272749	
3	p(x)= -8.48813796849639e-10*x**3 - 2.88009325106496e-20*x**2 + 0.00127322907280519*x + 0.500000000000003 $\|\|f(x)-p(x)\|\|_2$=0.277573499978	
4	p(x)= -2.82668469092201e-23*x**4 - 8.48813796849639e-10*x**3 + 2.82380459767495e-17*x**2 + 0.00127322907280519*x + 0.49999999999647 $\|\|f(x)-p(x)\|\|_2$=0.277573499978	

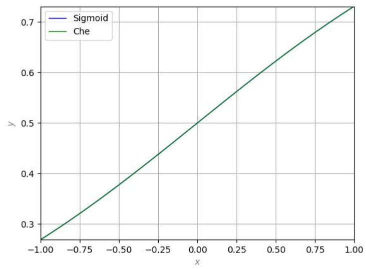
5	p(x)= 2.03709949776852e-15*x**5 - 2.82668469092201e-23*x**4 - 3.39518816904661e-9*x**3 + 2.82380459767495e-17*x**2 + 0.00190982266584751*x + 0.49999999999647 $\|\|f(x)-p(x)\|\|_2$=0.227121886433	
6	p(x)= 1.26509167228714e-28*x**6 + 2.03709949776852e-15*x**5 - 2.18030597747836e-22*x**4 - 3.39518816904661e-9*x**3 + 9.93994525385387e-17*x**2 + 0.00190982266584751*x + 0.499999999992517 $\|\|f(x)-p(x)\|\|_2$=0.227121886433	
7	p(x)= -5.82005451699162e-21*x**7 + 1.26509167228714e-28*x**6 + 1.22221949035234e-14*x**5 - 2.18030597747836e-22*x**4 - 8.48773587265306e-9*x**3 + 9.93994525385387e-17*x**2 + 0.0025463911289349*x + 0.499999999992517 $\|\|f(x)-p(x)\|\|_2$=0.196454079231	

8	p(x)= -7.98386789320987e-35*x**8 - 5.82005451699162e-21*x**7 + 2.86186525178869e-28*x**6 + 1.22221949035234e-14*x**5 - 3.17828946538786e-22*x**4 - 8.48773587265306e-9*x**3 + 1.19359122316838e-16*x**2 + 0.0025463911289349*x + 0.499999999991893 $\|f(x)-p(x)\|_2$=0.196454079231	
9	p(x)= 1.81058825288616e-26*x**9 - 7.98386789320987e-35*x**8 - 4.65582900573764e-20*x**7 + 2.86186525178869e-28*x**6 + 4.27758714124555e-14*x**5 - 3.17828946538786e-22*x**4 - 1.69748681811315e-8*x**3 + 1.19359122316838e-16*x**2 + 0.00318292604618453*x + 0.499999999991893 $\|f(x)-p(x)\|_2$=0.175319126035	

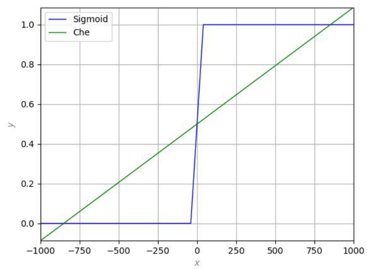
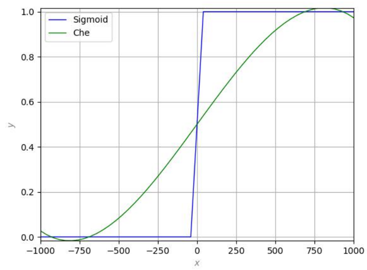
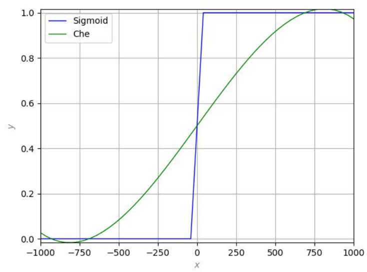
2. 基底: $\frac{1}{\sqrt{1-x^2}}$ 区间:[-1,1]

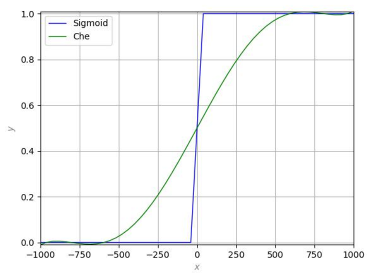
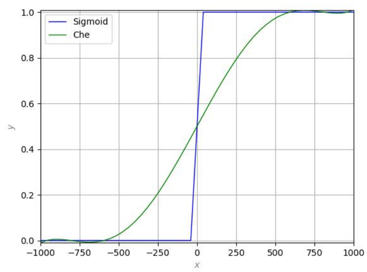
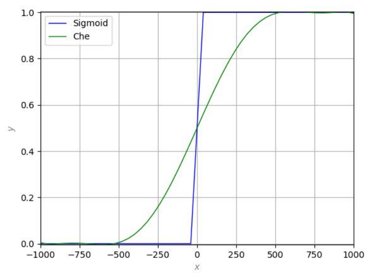
Degree	Polynomial Approximations	Sigmoid function, p(x)
2	p(x)= 1.5491123157387e-14*x**2 + 0.235571413924028*x + 0.499999999999994 $\|\|f(x)-p(x)\|\|_2$=0.00579206329109	
3	p(x)= -0.0184803669414559*x**3 + 1.5491123157387e-14*x**2 + 0.249431689130122*x + 0.499999999999994 $\|\|f(x)-p(x)\|\|_2$=0.000135757801158	
4	p(x)= -3.78730459342239e-12*x**4 - 0.0184803669414559*x**3 + 3.80279571656336e-12*x**2 + 0.249431689130122*x + 0.49999999999952 $\|\|f(x)-p(x)\|\|_2$=0.000135757801158	
5	p(x)= 0.00175743741756684*x**5 - 3.78730459342239e-12*x**4 - 0.0206771637134062*x**3 + 3.80279571656336e-12*x**2 + 0.249980888323105*x + 0.49999999999952	

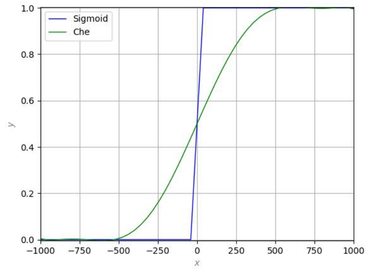
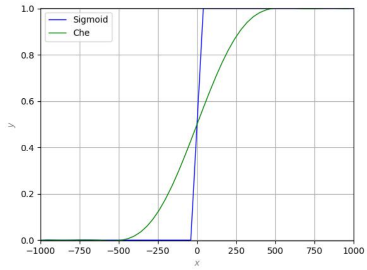
	$\|\|f(x)-p(x)\|\|_2$=3.26965839264e-06	
6	p(x)= 1.17288649126526e-11*x**6 + 0.00175743741756684*x**5 - 2.13806019630373e-11*x**4 - 0.0206771637134062*x**3 + 1.04002822305244e-11*x**2 + 0.249980888323105*x + 0.499999999999154 $\|\|f(x)-p(x)\|\|_2$=3.26965839266e-06	
7	p(x)= -0.000169323602892859*x**7 + 1.17288649126526e-11*x**6 + 0.00205375372264411*x**5 - 2.13806019630373e-11*x**4 - 0.0208253218659553*x**3 + 1.04002822305244e-11*x**2 + 0.249999408092176*x + 0.499999999999154 $\|\|f(x)-p(x)\|\|_2$=7.88505194259e-08	
8	p(x)= -2.54810357413633e-10*x**8 - 0.000169323602892859*x**7 + 5.21349579143191e-10*x**6 + 0.00205375372264411*x**5 - 3.39893547849677e-10*x**4 - 0.0208253218659553*x**3 + 7.41028712624025e-11*x**2 +	

	0.249999408092176*x + 0.499999999997163 $\|\|f(x)-p(x)\|\|_2$=7.88505194818e-08	
9	p(x)= 1.62992910768299e-5*x**9 - 2.54810357413633e-10*x**8 - 0.000205997007799754*x**7 + 5.21349579143191e-10*x**6 + 0.00208125877631007*x**5 - 3.39893547849677e-10*x**4 - 0.0208329621586357*x**3 + 7.41028712624025e-11*x**2 + 0.249999981114126*x + 0.499999999997163 $\|\|f(x)-p(x)\|\|_2$=1.91455342714e-09	

3.基底：$e^{-(1000/x)^2}$，当 x=0 时，取 x=0.00001 区间:[-1000,1000]

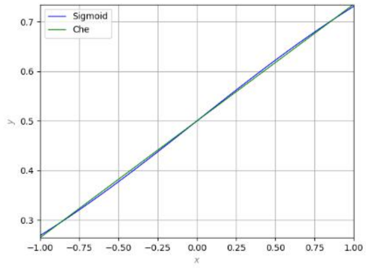
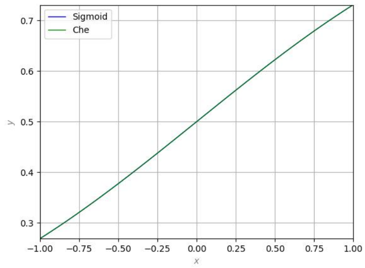
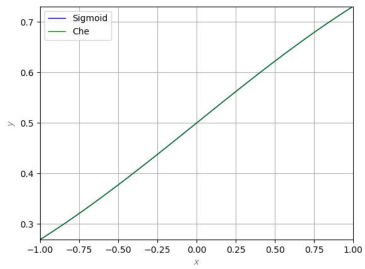
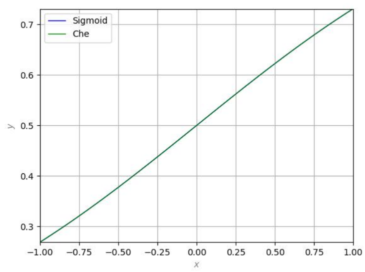
Degree	Polynomial Approximations	Sigmoid function, p(x)
2	p(x)= 4.73923210183516e-16*x**2 + 0.000586995282474419*x + 0.499999999663507 $\|\|f(x)-p(x)\|\|_2$=0.976650896962	
3	p(x)= -4.80591420542768e-10*x**3 + 4.73923210183516e-16*x**2 + 0.000953862994164936*x + 0.499999999663507 $\|\|f(x)-p(x)\|\|_2$=0.270652475585	
4	p(x)= -1.50228252955222e-20*x**4 - 4.80591420542768e-10*x**3 + 2.04294971199605e-14*x**2 + 0.000953862994164936*x + 0.499999993637141 $\|\|f(x)-p(x)\|\|_2$=0.270652475585	

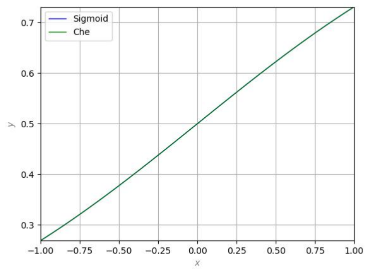
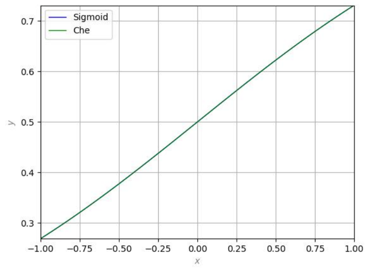
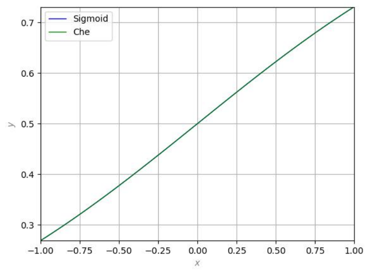
5	p(x)= 6.65326014392383e-16*x**5 - 1.50228252955222e-20*x**4 - 1.41373000865643e-9*x**3 + 2.04294971199605e-14*x**2 + 0.00125843090769336*x + 0.499999993637141 $\|\|f(x)-p(x)\|\|_2$=0.0941592146779	
6	p(x)= 2.85753271019652e-25*x**6 + 6.65326014392383e-16*x**5 - 5.62766836563708e-19*x**4 - 1.41373000865643e-9*x**3 + 3.46463057805243e-13*x**2 + 0.00125843090769336*x + 0.49999993468174 $\|\|f(x)-p(x)\|\|_2$=0.0941592146779	
7	p(x)= -1.09888498097995e-21*x**7 + 2.85753271019652e-25*x**6 + 2.8681970128863e-15*x**5 - 5.62766836563708e-19*x**4 - 2.80283391311553e-9*x**3 + 3.46463057805243e-13*x**2 + 0.00152931479143287*x + 0.49999993468174 $\|\|f(x)-p(x)\|\|_2$=0.0372119260932	

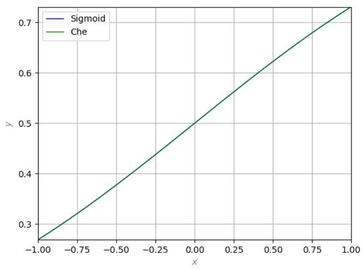
8	p(x)= -4.21283559444646e-30*x**8 - 1.09888498097995e-21*x**7 + 1.07747217556232e-23*x**6 + 2.8681970128863e-15*x**5 - 9.80575539490412e-18*x**4 - 2.80283391311553e-9*x**3 + 3.71679113321182e-12*x**2 + 0.00152931479143287*x + 0.499999513025745 $\|f(x)-p(x)\|_2$=0.0372119260934	
9	p(x)= 2.00207839846178e-27*x**9 - 4.21283559444646e-30*x**8 - 6.27909899367563e-21*x**7 + 1.07747217556232e-23*x**6 + 7.65269878100198e-15*x**5 - 9.80575539490412e-18*x**4 - 4.65167102353083e-9*x**3 + 3.71679113321182e-12*x**2 + 0.00177789475527988*x + 0.499999513025745 $\|f(x)-p(x)\|_2$=0.0160062427207	

4.基底:$e^{-(1/x)^2}$，当 x=0 时,取 x=0.00001 区间:[-1,1]

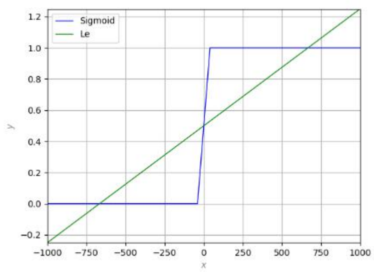
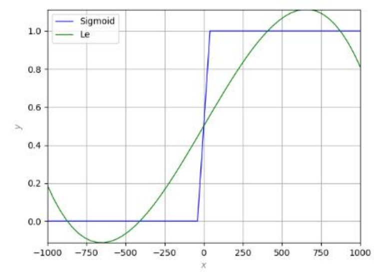
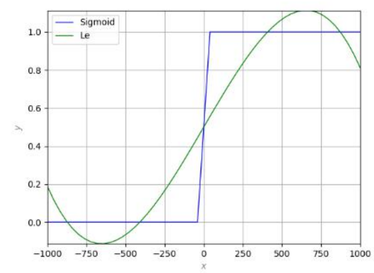
Degree	Polynomial Approximations	Sigmoid function, p(x)

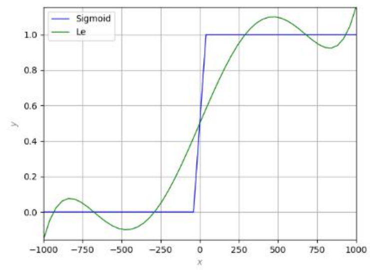
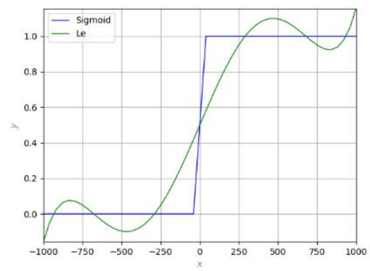
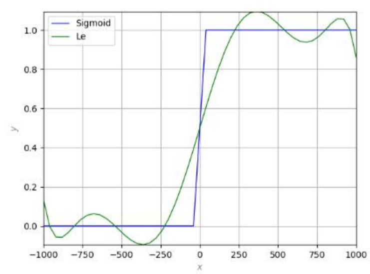
2	p(x)= 9.50385053384505e-10*x**2 + 0.235274350264956*x + 0.499999999325213 $\|f(x)-p(x)\|_2$=0.00112440919402	
3	p(x)= -0.0182070283763714*x**3 + 9.50385053384505e-10*x**2 + 0.249172997955295*x + 0.499999999325213 $\|f(x)-p(x)\|_2$=2.06746497109e-05	
4	p(x)= -3.00836326899558e-8*x**4 - 0.0182070283763714*x**3 + 4.09119864194152e-8*x**2 + 0.249172997955295*x + 0.499999987257244 $\|f(x)-p(x)\|_2$=2.06746497171e-05	
5	p(x)= 0.0017139206042993*x**5 - 3.00836326899558e-8*x**4 - 0.0206108505902007*x**3 + 4.09119864194152e-8*x**2 + 0.249957583573638*x + 0.499999987257244 $\|f(x)-p(x)\|_2$=4.07772394306e-07	

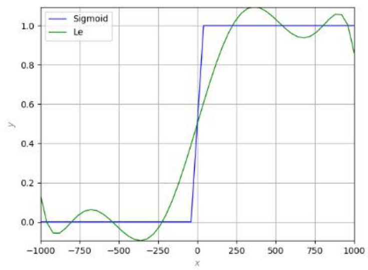
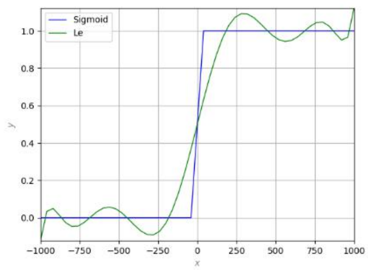
6	p(x)= 5.56153313641097e-7*x**6 + 0.0017139206042993*x**5 - 1.09614191783775e-6*x**4 - 0.0206108505902007*x**3 + 6.75461638925146e-7*x**2 + 0.249957583573638*x + 0.499999872514062 $\|\|f(x)-p(x)\|\|_2$=4.07777237783e-07	
7	p(x)= -0.00016381184455958*x**7 + 5.56153313641097e-7*x**6 + 0.00204230470963145*x**5 - 1.09614191783775e-6*x**4 - 0.0208179256494335*x**3 + 6.75461638925146e-7*x**2 + 0.249997964495491*x + 0.499999872514062 $\|\|f(x)-p(x)\|\|_2$=8.57766125944e-09	
8	p(x)= -7.61968477690841e-6*x**8 - 0.00016381184455958*x**7 + 1.95273917968505e-5*x**6 + 0.00204230470963145*x**5 - 1.78138135136454e-5*x**4 - 0.0208179256494335*x**3 + 6.77133716349788e-6*x**2 + 0.249997964495491*x + 0.499999109868424 $\|\|f(x)-p(x)\|\|_2$=1.04261674754e-08	

9	p(x)= 1.53550405081618e-5*x**9 - 7.61968477690841e-6*x**8 - 0.000203541757531201*x**7 + 1.95273917968505e-5*x**6 + 0.00207899968996794*x**5 - 1.78138135136454e-5*x**4 - 0.0208321054010187*x**3 + 6.77133716349788e-6*x**2 + 0.249999870992509*x + 0.499999109868424 $\|\|f(x)-p(x)\|\|_2$=6.27758704531e-09	

5.基底:1 区间:[-1000,1000]

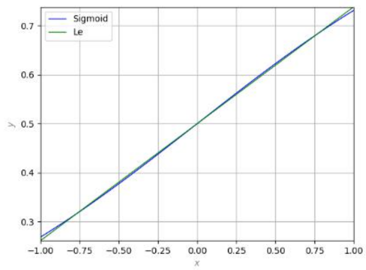
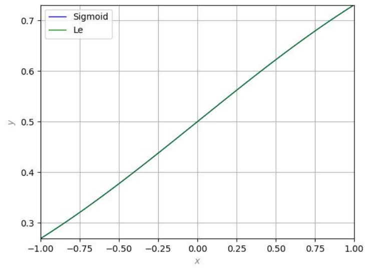
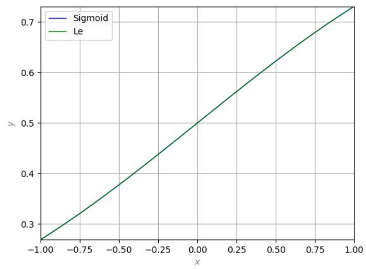
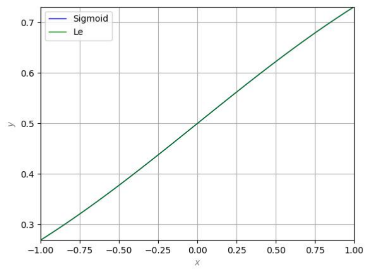
Degree	Polynomial Approximations	Sigmoid function, p(x)
2	p(x)= -1.30104260698261e-22*x**2 + 0.000749997532599195*x + 0.499999999999998 $\|\|f(x)-p(x)\|\|_2$=11.1356395145	
3	p(x)= -1.09372841048899e-9*x**3 - 1.30104260698261e-22*x**2 + 0.00140623457889259*x + 0.499999999999998 $\|\|f(x)-p(x)\|\|_2$=8.32569074172	
4	p(x)= -2.32283011287114e-27*x**4 - 1.09372841048899e-9*x**3 + 1.86089297890557e-21*x**2 + 0.00140623457889259*x + 0.499999999999998 $\|\|f(x)-p(x)\|\|_2$=8.32569074172	

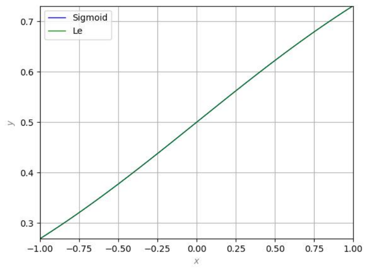
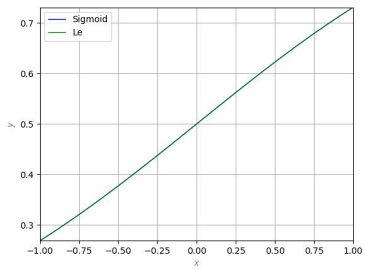
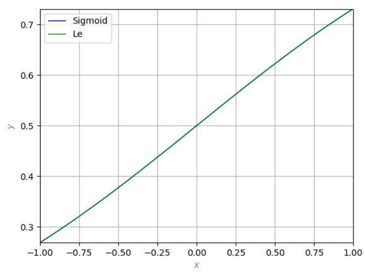
5	p(x)= 2.70689766766883e-15*x**5 - 2.32283011287114e-27*x**4 - 4.10139248567655e-9*x**3 + 1.86089297890557e-21*x**2 + 0.00205073402357563*x + 0.499999999999998 $\|f(x)-p(x)\|_2$=6.91627584969	
6	p(x)= -1.08052338942169e-30*x**6 + 2.70689766766883e-15*x**5 + 1.47111815546216e-24*x**4 - 4.10139248567655e-9*x**3 - 4.89286102212774e-19*x**2 + 0.00205073402357563*x + 0.500000000000021 $\|f(x)-p(x)\|_2$=6.91627584969	
7	p(x)= -7.85450106007808e-21*x**7 - 1.08052338942169e-30*x**6 + 1.53949378416417e-14*x**5 + 1.47111815546216e-24*x**4 - 9.86868347384634e-9*x**3 - 4.89286102212774e-19*x**2 + 0.0026915441333723*x + 0.500000000000021 $\|f(x)-p(x)\|_2$=6.0326518198	

8	p(x)= -1.07741520106648e-36*x**8 - 7.85450106007808e-21*x**7 + 9.30651652568123e-31*x**6 + 1.53949378416417e-14*x**5 + 3.10824862007252e-25*x**4 - 9.86868347384634e-9*x**3 - 2.78323685221168e-19*x**2 + 0.0026915441333723*x + 0.500000000000015 $\|\|f(x)-p(x)\|\|_2$=6.0326518198	
9	p(x)= 2.46639357598473e-26*x**9 - 1.07741520106648e-36*x**8 - 6.00840120808315e-20*x**7 + 9.30651652568123e-31*x**6 + 5.19555955560798e-14*x**5 + 3.10824862007252e-25*x**4 - 1.92432110929027e-8*x**3 - 2.78323685221168e-19*x**2 + 0.00333071647103233*x + 0.500000000000015 $\|\|f(x)-p(x)\|\|_2$=5.41221067639	

6. 基底:1 区间:[-1,1]

Degree	Polynomial Approximations	Sigmoid function, p(x)

2	p(x)= -1.54696099709161e-15*x**2 + 0.238327951492686*x + 0.500000000000001 $\|f(x)-p(x)\|_2$=0.00400430162746	
3	p(x)= -0.0187229765012767*x**3 - 1.54696099709161e-15*x**2 + 0.249561737393452*x + 0.500000000000001 $\|f(x)-p(x)\|_2$=9.64135174469e-05	
4	p(x)= -4.92647174780368e-15*x**4 - 0.0187229765012767*x**3 + 2.67572907245441e-15*x**2 + 0.249561737393452*x + 0.5 $\|f(x)-p(x)\|_2$=9.64135174469e-05	
5	p(x)= 0.00178009152069321*x**5 - 4.92647174780368e-15*x**4 - 0.0207008559687136*x**3 + 2.67572907245441e-15*x**2 + 0.249985568707902*x + 0.5 $\|f(x)-p(x)\|_2$=2.33591804586e-06	

6	p(x)= 1.38943368129522e-13*x**6 + 0.00178009152069321*x**5 - 1.94394701015332e-13*x**4 - 0.0207008559687136*x**3 + 6.58318054949632e-14*x**2 + 0.249985568707902*x + 0.499999999999997 $\|\|f(x)-p(x)\|\|_2$=2.33591804587e-06	
7	p(x)= -0.000171474020962806*x**7 + 1.38943368129522e-13*x**6 + 0.00205708801609467*x**5 - 1.94394701015332e-13*x**4 - 0.0208267634666234*x**3 + 6.58318054949632e-14*x**2 + 0.249999558429892*x + 0.499999999999997 $\|\|f(x)-p(x)\|\|_2$=5.65300989637e-08	
8	p(x)= 2.33715930638571e-12*x**8 - 0.000171474020962806*x**7 - 4.22375400379092e-12*x**6 + 0.00205708801609467*x**5 + 2.32254609047756e-12*x**4 - 0.0208267634666234*x**3 - 3.9179379295837e-13*x**2 + 0.249999558429892*x + 0.50000000000001 $\|\|f(x)-p(x)\|\|_2$=5.65300989513e-08	

9	p(x)= 1.65409312968551e-5*x**9 + 2.33715930638571e-12*x**8 - 0.000206501875473747*x**7 - 4.22375400379092e-12*x**6 + 0.00208160751425229*x**5 + 2.32254609047756e-12*x**4 - 0.020833050517433*x**3 - 3.9179379295837e-13*x**2 + 0.249999987092448*x + 0.50000000000001 $\|\|f(x)-p(x)\|\|_2$=1.36664400078e-09