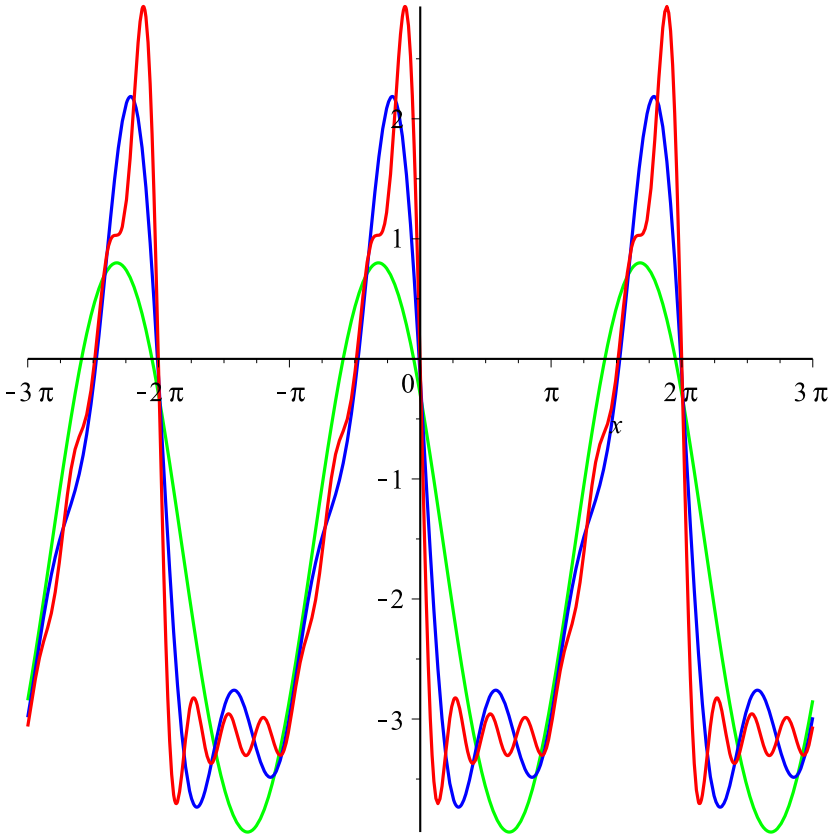
>

$$\begin{cases} \pi + 2\,x & -\pi \le x \text{ and } x < 0 \\ -\pi & 0 < x \text{ and } x < \pi \end{cases}$$

$$a0 := -\pi$$

$$an := \frac{2\,(-1)^{1+n\sim} + 2}{n\sim^2\,\pi}$$

$$bn := -\frac{2}{n\sim}$$



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$$\begin{cases} x + 2 & 0 \le x \text{ and } x < 2 \\ -1 & 2 \le x \text{ and } x < 5 \end{cases}$$

$$left := 0$$

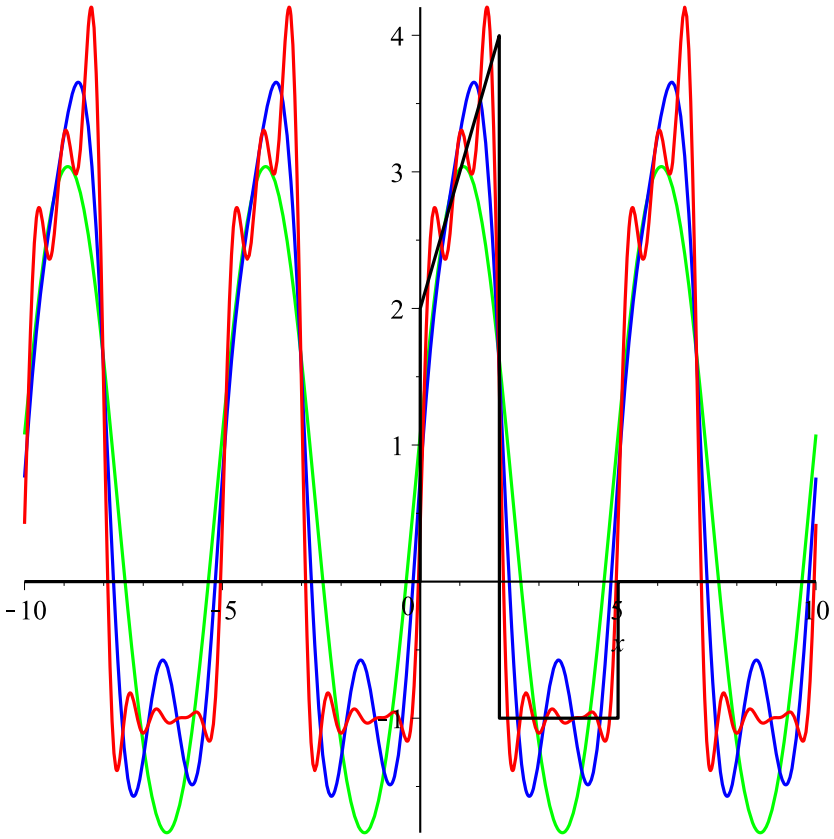
$$right := 5$$

$$l := \frac{5}{2}$$

$$a0 := \frac{6}{5}$$

$$an := \frac{5}{2}\ \frac{2\sin\left(\frac{4}{5}\,\pi\,n\sim\right)\pi\,n\sim + \cos\left(\frac{4}{5}\,\pi\,n\sim\right) - 1}{\pi^2\,n\sim^2}$$

$$bn := -\frac{1}{2}\ \frac{10\cos\left(\frac{4}{5}\,\pi\,n\sim\right)\pi\,n\sim - 6\,\pi\,n\sim - 5\sin\left(\frac{4}{5}\,\pi\,n\sim\right)}{\pi^2\,n\sim^2}$$



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$$\begin{cases} (x-1)^2 & 0 \le x \ \textbf{and}\ x < 2 \\ 3 - x & 2 \le x \ \textbf{and}\ x < 3 \end{cases}$$

$$left := 0$$

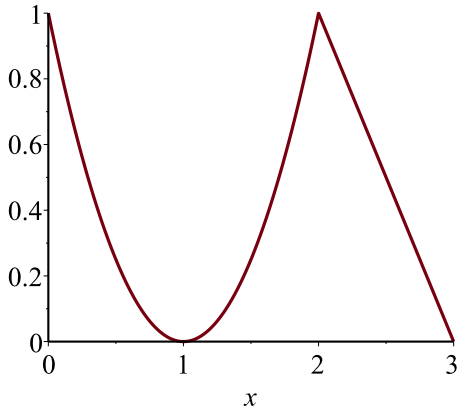
$$right := 3$$

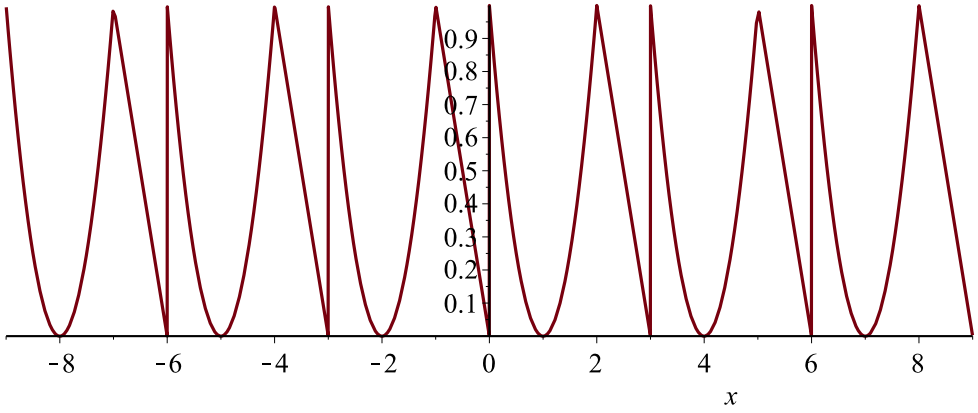
$$l := \frac{3}{2}$$

$$a0 := \frac{7}{9}$$

$$an := \frac{3}{2}\ \frac{3\,\pi\,n\sim\cos\left(\frac{4}{3}\,\pi\,n\sim\right)+\pi\,n\sim-3\sin\left(\frac{4}{3}\,\pi\,n\sim\right)}{\pi^3\,n\sim^3}$$

$$bn := \frac{1}{2}\ \frac{2\,\pi^2\,n\sim^2+9\sin\left(\frac{4}{3}\,\pi\,n\sim\right)\pi\,n\sim+9\cos\left(\frac{4}{3}\,\pi\,n\sim\right)-9}{\pi^3\,n\sim^3}$$





$$\begin{cases} (x-1)^2 & 0 \le x \text{ and } x < 2 \\ 3-x & 2 \le x \text{ and } x < 3 \\ x+3 & -3 \le x \text{ and } x < -2 \\ (x+1)^2 & -2 \le x \text{ and } x < 0 \end{cases}$$

$$left := -3$$

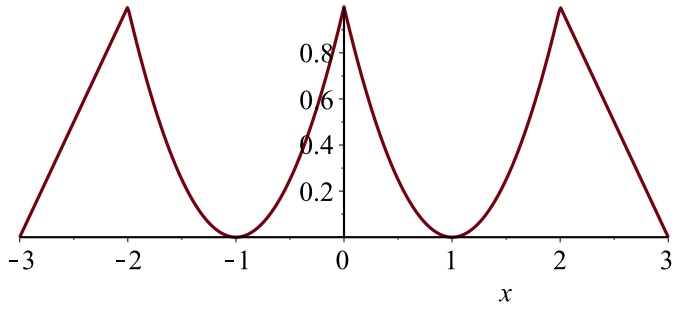
$$right := 3$$

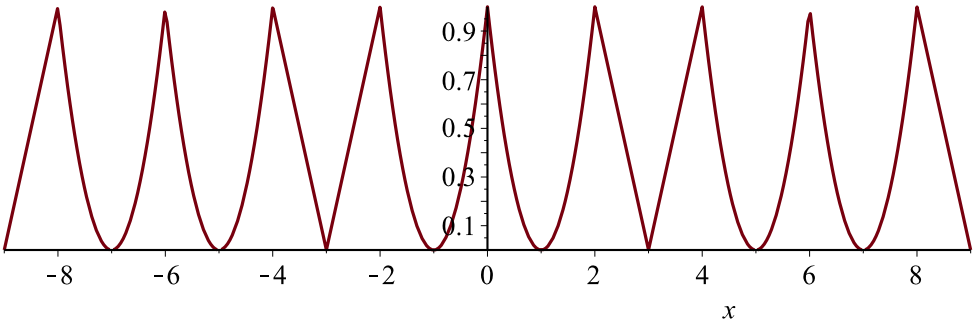
$$l := 3$$

$$a0 := \frac{7}{9}$$

$$an := \frac{18\,\pi\,n\sim\cos\left(\frac{2}{3}\,\pi\,n\sim\right) + 6\,(-1)^{1+n\sim}\,\pi\,n\sim + 12\,\pi\,n\sim - 36\sin\left(\frac{2}{3}\,\pi\,n\sim\right)}{\pi^3\,n\sim^3}$$

$$bn := 0$$





$$\begin{cases} (x-1)^2 & 0 \le x \text{ and } x < 2 \\ 3-x & 2 \le x \text{ and } x < 3 \\ -x-3 & -3 \le x \text{ and } x < -2 \\ -(x+1)^2 & -2 \le x \text{ and } x < 0 \end{cases}$$

$$left := -3$$

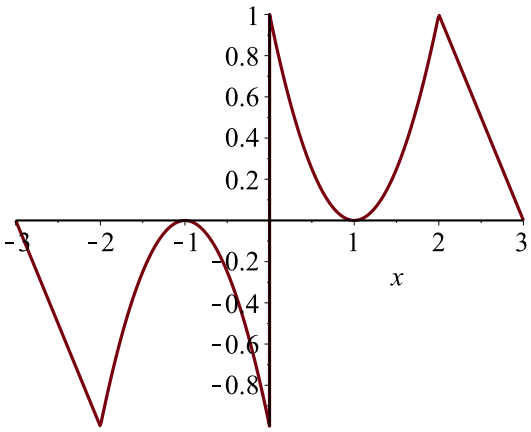
$$right := 3$$

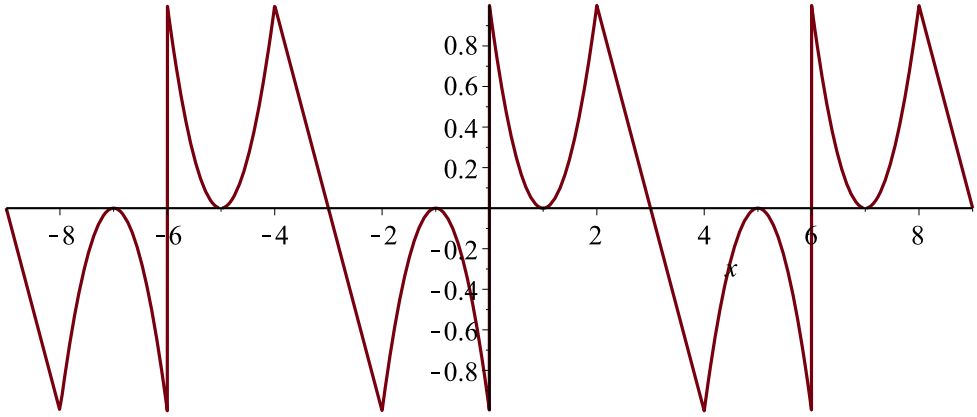
$$l := 3$$

$$a0 := 0$$

$$an := 0$$

$$bn := \frac{2\,\pi^2\,n\sim^2 + 18\sin\left(\frac{2}{3}\,\pi\,n\sim\right)\pi\,n\sim + 36\cos\left(\frac{2}{3}\,\pi\,n\sim\right) - 36}{\pi^3\,n\sim^3}$$





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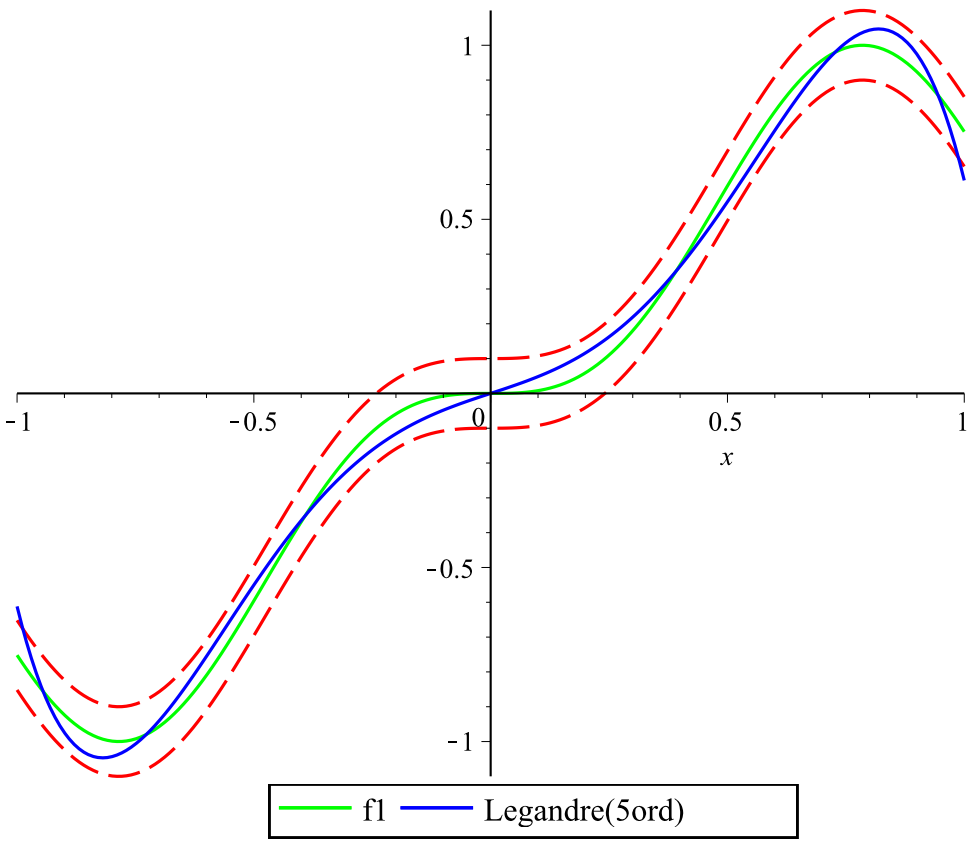
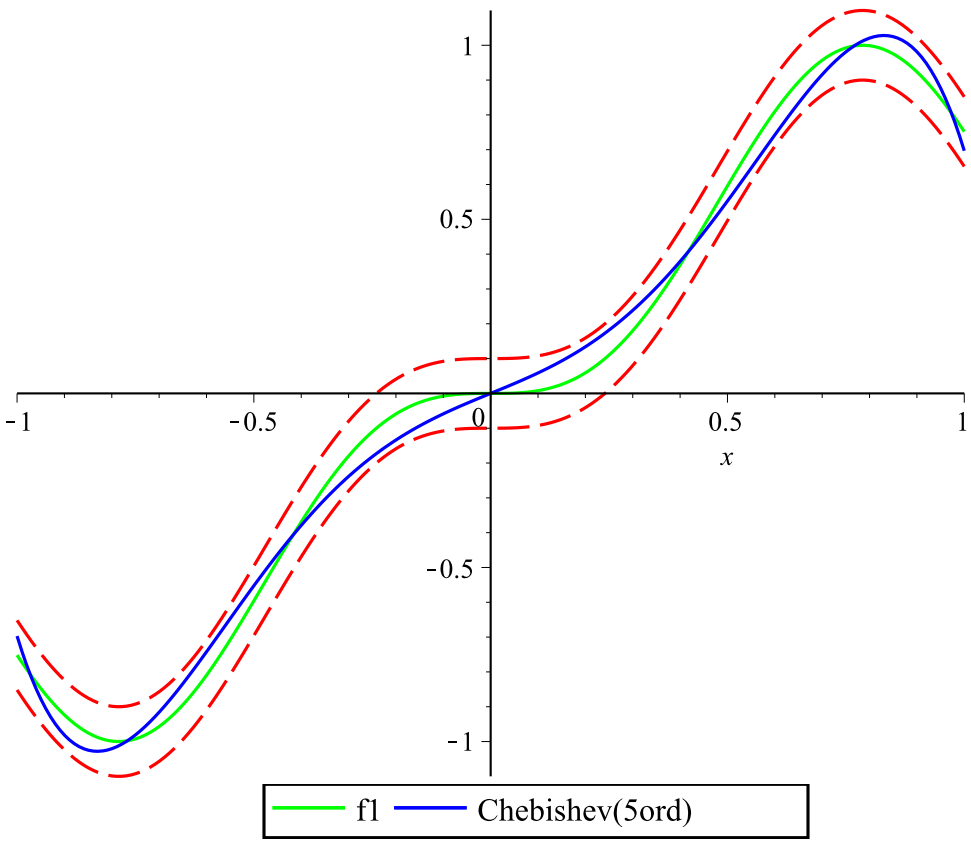
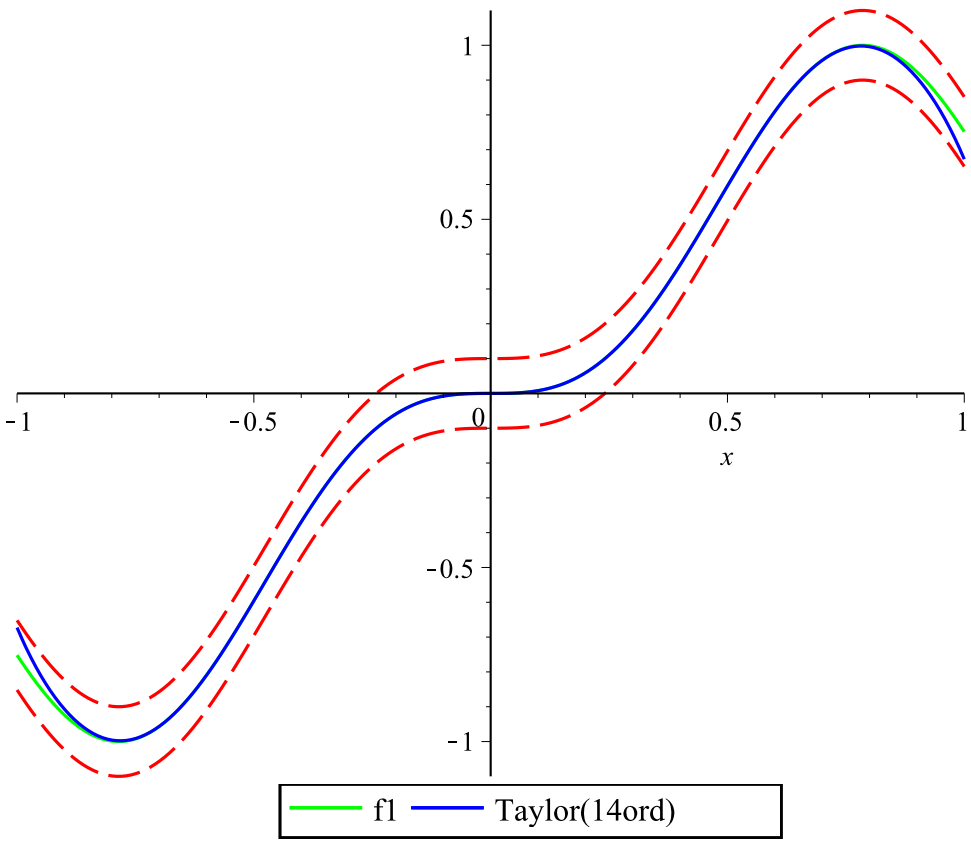
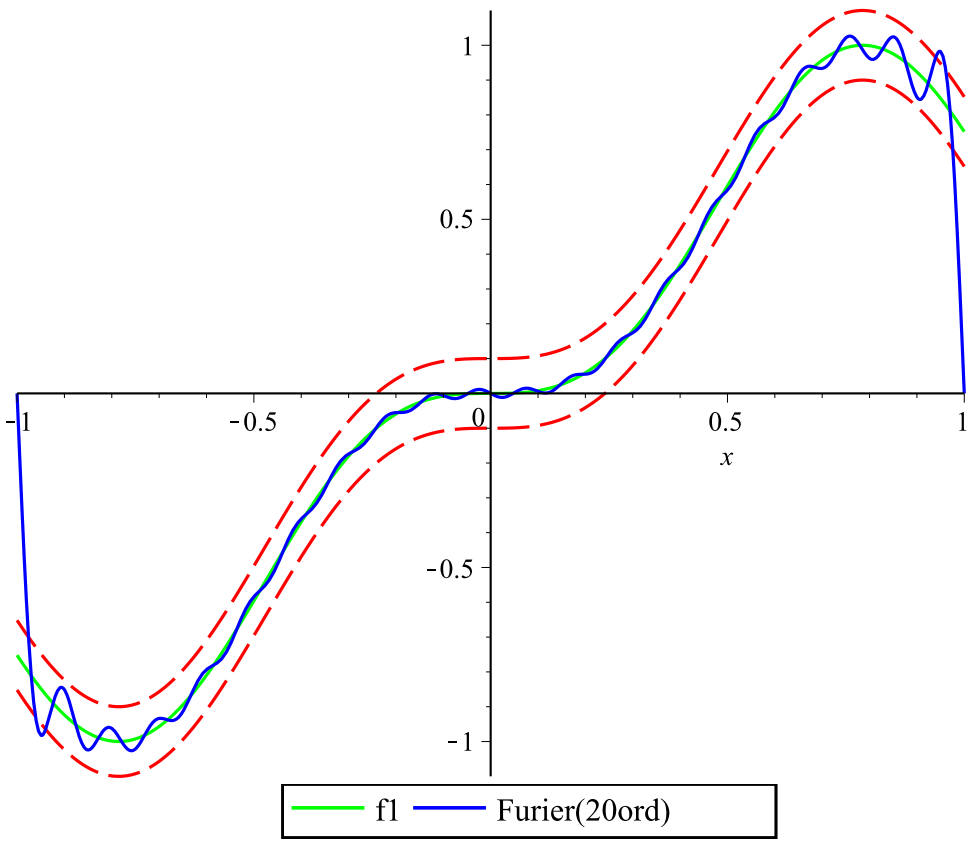
$$f1 := x \rightarrow \sin(2\,x)^3$$


1
0.5
-0.5
-1
-1
-0.5
0
0.5
1
x
f1
Legandre(5ord)

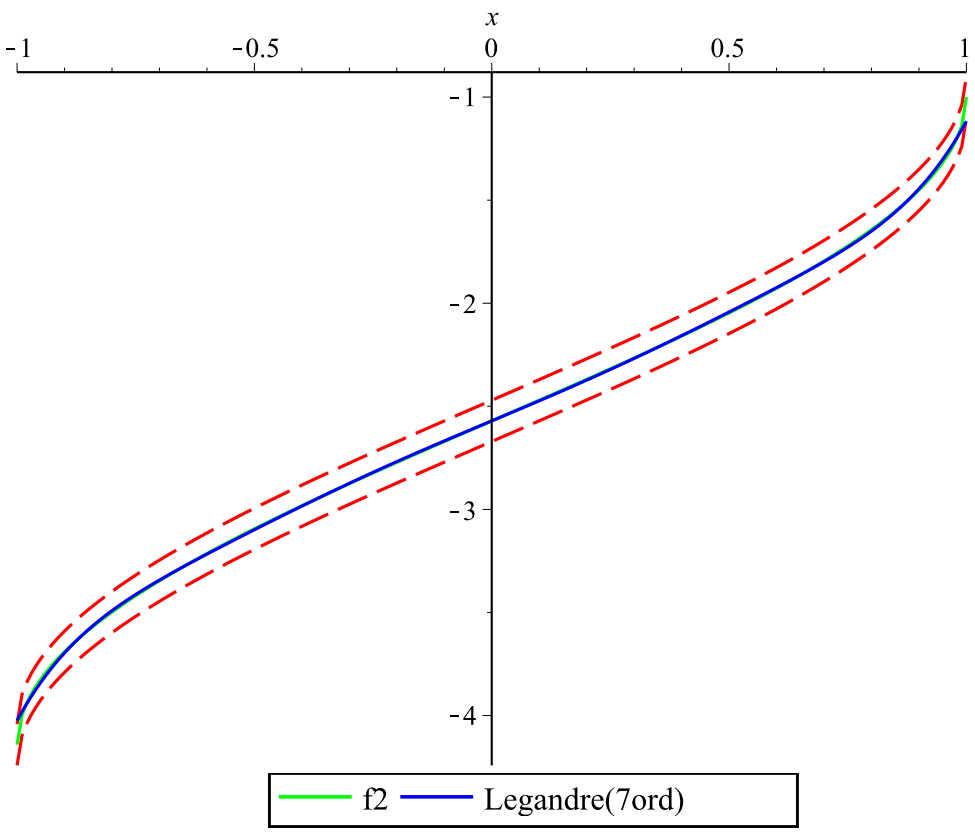

1
0.5
-1
-0.5
0
0.5
1
x
-0.5
-1
f1
Chebishev(5ord)

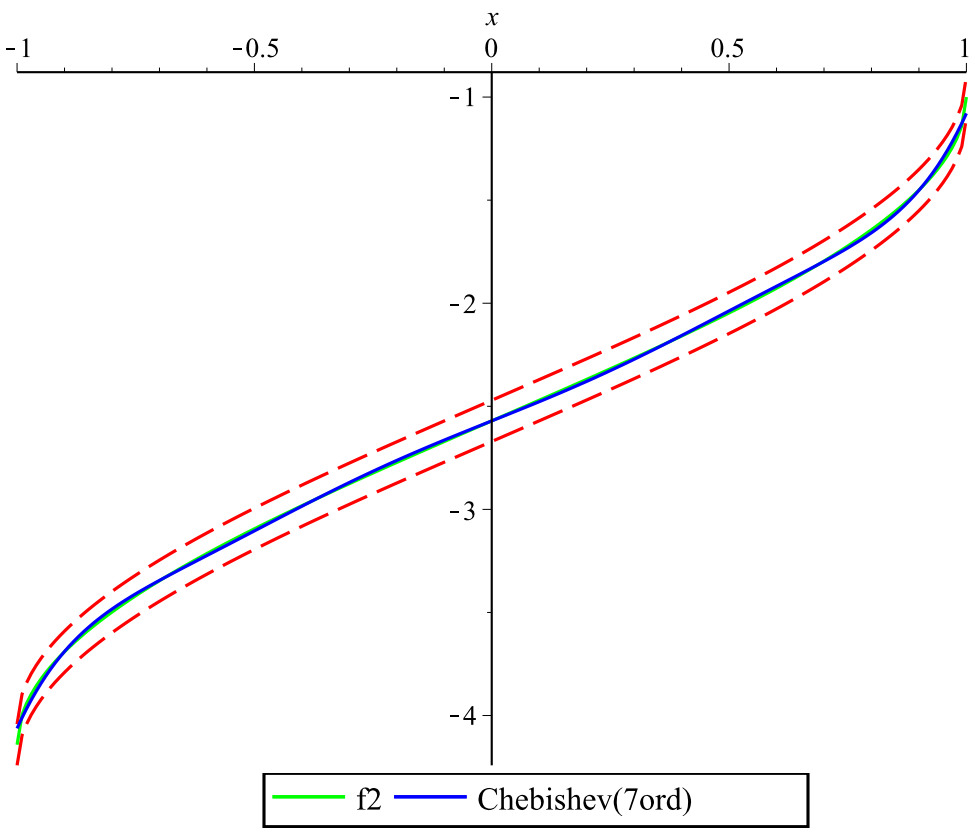

1
0.5
-0.5
-1
-1
-0.5
0
0.5
1
x
f1
Taylor(14ord)

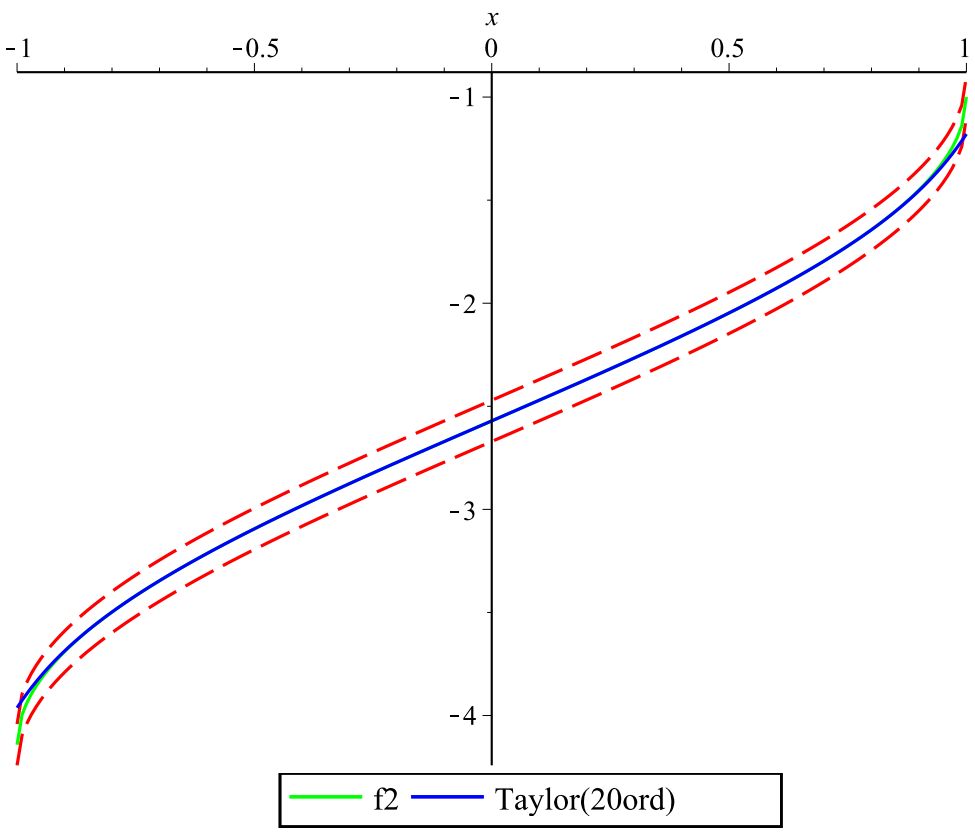


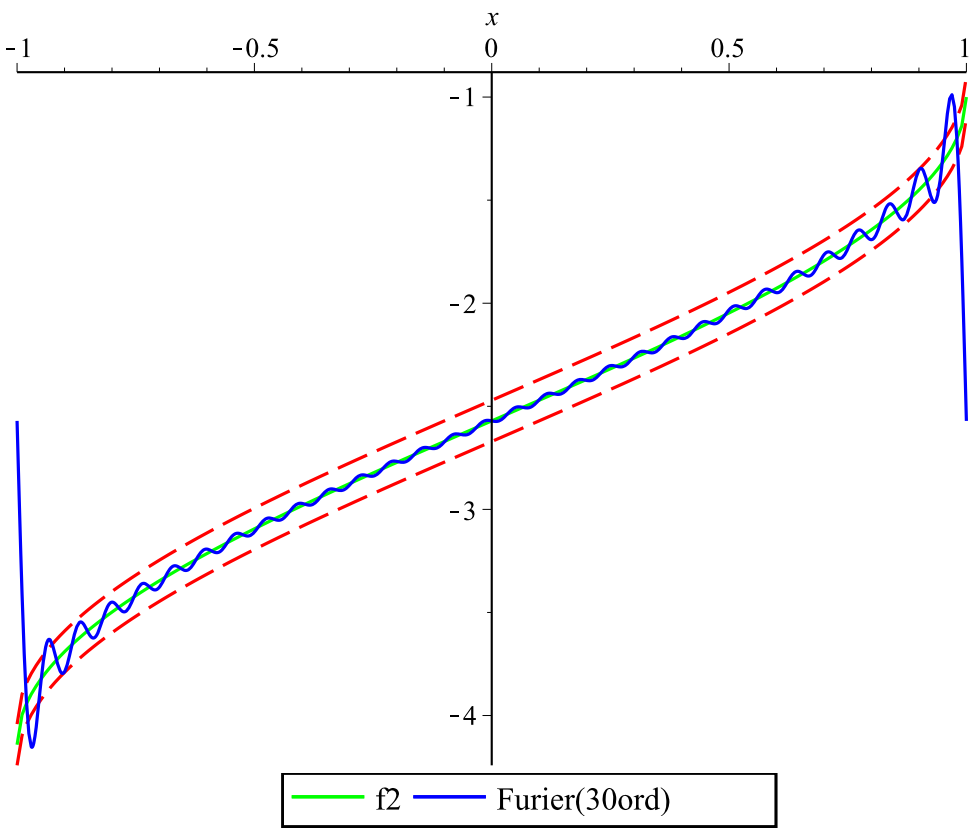
>

$$f2 := x \rightarrow -\arccos(x) - 1$$


x
-1
-0.5
0
0.5
1
-1
-2
-3
-4
f2
Legandre(7ord)


x
-1
-0.5
0
0.5
1
-1
-2
-3
-4
f2
Chebishev(7ord)


x
-1
-0.5
0
0.5
1
-1
-2
-3
-4
f2
Taylor(20ord)



>

$$f1 := x \to \sin(2\,x)^3$$

$$f2 := x \to -\arccos(x) - 1$$

"Legandre f1"

$$c_0 := 0$$

$$c_1 := -\frac{1}{2}\sin(2)^2\cos(2) - \cos(2) + \frac{1}{12}\sin(2)^3 + \frac{1}{2}\sin(2)$$

$$c_2 := 0$$

$$c_3 := -\frac{49}{72}\sin(2)^2\cos(2) + \frac{133}{18}\cos(2) + \frac{469}{432}\sin(2)^3 + \frac{77}{36}\sin(2)$$

$$c_4 := 0$$

$$c_5 := \frac{209}{96}\sin(2)^2\cos(2) - \frac{6215}{96}\sin(2) - \frac{6721}{48}\cos(2) + \frac{715}{576}\sin(2)^3$$

"Legandre f2"

$$c_0 := -\frac{1}{2}\pi - 1$$

$$c_1 := \frac{3}{8}\,\pi$$

$$c_2 := 0$$

$$c_3 := \frac{7}{128}\,\pi$$

$$c_4 := 0$$

$$c_5 := \frac{11}{512}\,\pi$$

$$c_6 := 0$$

$$c_7 := \frac{375}{32768}\,\pi$$

"Chebishev f1"

$$c_0 := 0$$

$$c_1 := \frac{1}{2}\left(\int_{-1}^{1} \frac{\sin(2\,x)^3\,x}{\sqrt{-x^2+1}}\,dx\right)\pi$$

$$c_2 := 0$$

$$c_3 := \frac{1}{2}\left(\int_{-1}^{1} \frac{\sin(2\,x)^3\,(4\,x^3-3\,x)}{\sqrt{-x^2+1}}\,dx\right)\pi$$

$$c_4 := 0$$

$$c_5 := \frac{1}{2}\left(\int_{-1}^{1} \frac{\sin(2\,x)^3\,(16\,x^5-20\,x^3+5\,x)}{\sqrt{-x^2+1}}\,dx\right)\pi$$

"Chebishev f2"

$$c_0 := -\frac{1}{2}\,\pi - 1$$

$$c_1 := \frac{4}{\pi}$$

$$c_2 := 0$$

$$c_3 := \frac{4}{9\,\pi}$$

$$c_4 := 0$$

$$c_5 := \frac{4}{25\,\pi}$$

$$c_6 := 0$$

$$c_7 := \frac{4}{49\,\pi}$$

"Taylor f1"

$$8\,x^3 - 16\,x^5 + \frac{208}{15}\,x^7 - \frac{1312}{189}\,x^9 + \frac{10736}{4725}\,x^{11} - \frac{2336}{4455}\,x^{13}$$

"Taylor f2"

$$-\frac{1}{2}\,\pi - 1 + x + \frac{1}{6}\,x^3 + \frac{3}{40}\,x^5 + \frac{5}{112}\,x^7 + \frac{35}{1152}\,x^9 + \frac{63}{2816}\,x^{11} + \frac{231}{13312}\,x^{13} + \frac{143}{10240}\,x^{15} + \frac{6435}{557056}\,x^{17} + \frac{12155}{1245184}\,x^{19}$$

"Furier f1"

$$a0 := 0$$

$$an := 0$$

$$bn := \frac{1}{2}\,\frac{(-1)^{1+n\sim}\,\pi\,n\sim\left(3\,\pi^2\,n\sim^2\sin(2) - \pi^2\,n\sim^2\sin(6) - 108\sin(2) + 4\sin(6)\right)}{\pi^4\,n\sim^4 - 40\,\pi^2\,n\sim^2 + 144}$$

"Furier f2"

$$a0 := -\pi - 2$$

$$an := 0$$

$$bn := \int_{-1}^{1} (-\arccos(x) - 1)\,\sin(\pi\,n\sim x)\,dx \qquad \textbf{(1)}$$

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