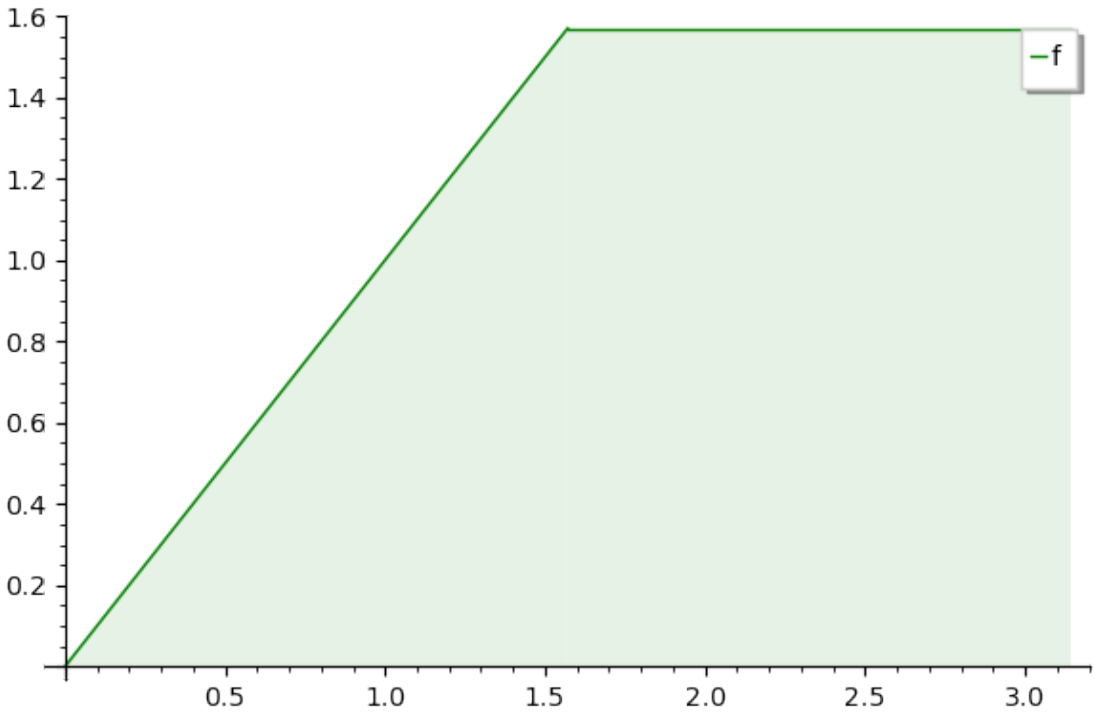
AC_WHW2

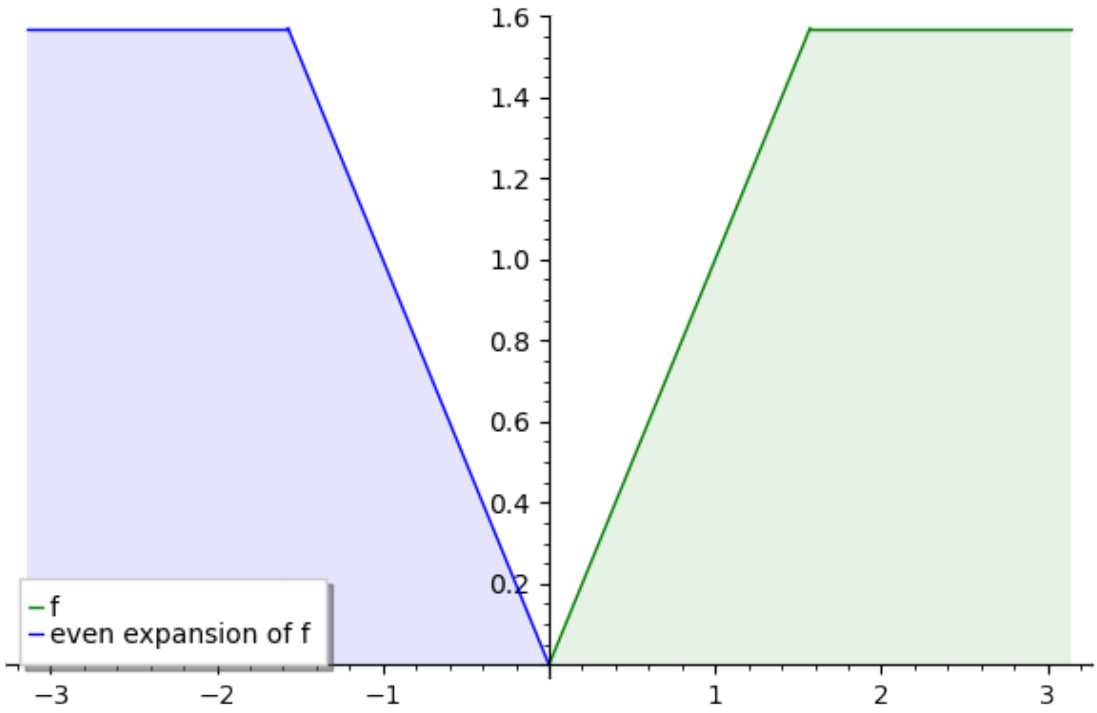
October 10, 2021

[184]:
```
f1 = x ; f2 = pi/2
plt = plot([])
plt += plot(f1, (0, pi/2), color='green', fill='axis', fillcolor='green',␣
 ↪fillalpha=.1)
plt += plot(f2, (pi/2,pi), legend_label='f', fill='axis', color='green',␣
 ↪fillcolor='green', fillalpha=.1)
plt.show()
```



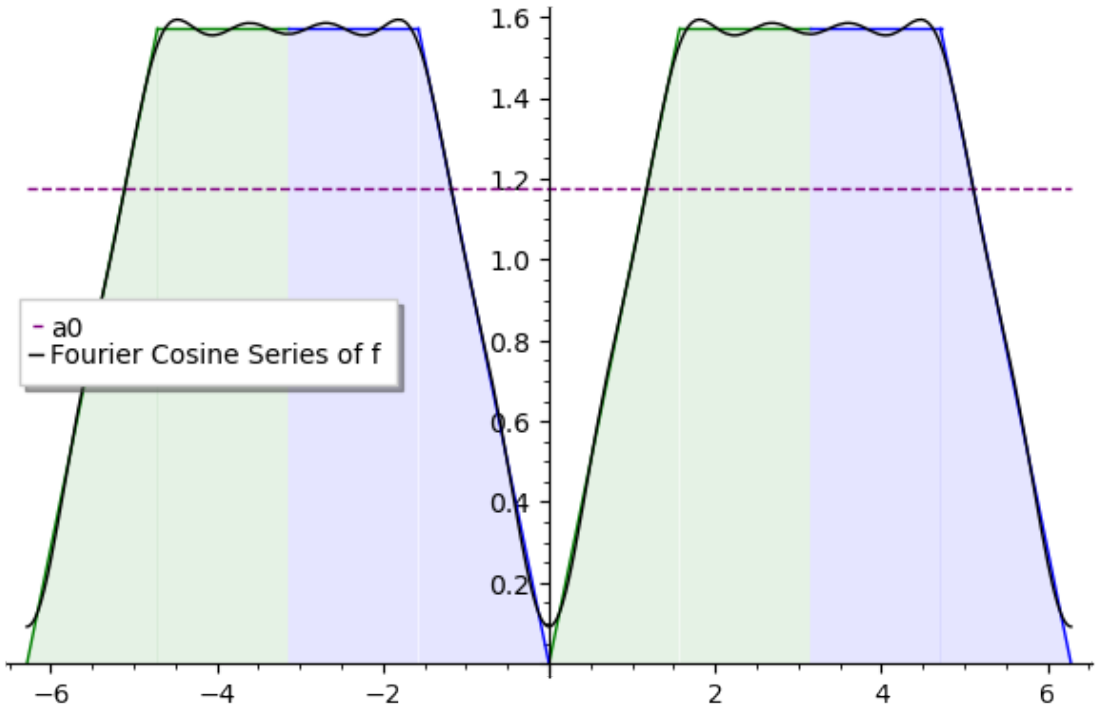
[178]:
```
f1 = x ; f2 = pi/2; f3 = -x; a0= pi/4
plt = plot([])
plt += plot(f1, (0, pi/2), color='green', fill='axis', fillcolor='green',␣
 ↪fillalpha=.1)
```

```
plt += plot(f3, (-pi/2, 0), color='blue', fill='axis', fillcolor='blue',␣
 ↪fillalpha=.1)
plt += plot(f2, (pi/2,pi), legend_label='f', color='green', fill='axis',␣
 ↪fillcolor='green', fillalpha=.1)
plt += plot(f2, (-pi,-pi/2), legend_label='even expansion of f', color='blue',␣
 ↪fill='axis', fillcolor='blue', fillalpha=.1)
plt.show()
```

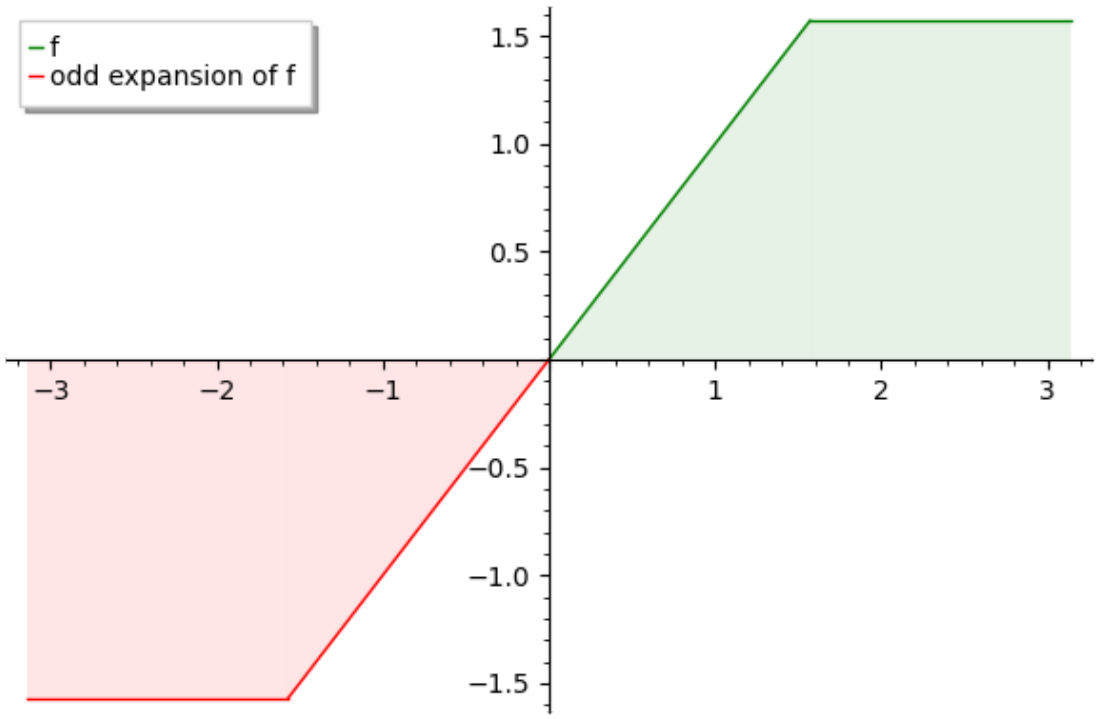


[197]:
```
f1 = x ; f2 = pi/2; f3 = -x; a0= 3*pi/8
feven = a0 - 2*cos(x)/pi - 4*cos(2*x)/(4*pi) - 2*cos(3*x)/(9*pi) - 2*cos(5*x)/
 ↪(25*pi) - 4*cos(6*x)/(36*pi)
plt = plot([])
plt += plot(f1, (0, pi/2), color='green', fill='axis', fillcolor='green',␣
 ↪fillalpha=.1)
plt += plot(f1+(2*pi), (-2*pi, -3*pi/2), color='green', fill='axis',␣
 ↪fillcolor='green', fillalpha=.1)
plt += plot(f3, (-pi/2, 0), color='blue', fill='axis', fillcolor='blue',␣
 ↪fillalpha=.1)
plt += plot(f3+(2*pi), (3*pi/2, 2*pi), color='blue', fill='axis',␣
 ↪fillcolor='blue', fillalpha=.1)
plt += plot(f2, (pi/2,pi), color='green', fill='axis', fillcolor='green',␣
 ↪fillalpha=.1)
```

```
plt += plot(f2, (-3*pi/2,-pi), color='green', fill='axis', fillcolor='green',␣
 ↪fillalpha=.1)
plt += plot(f2, (-pi,-pi/2), color='blue', fill='axis', fillcolor='blue',␣
 ↪fillalpha=.1)
plt += plot(f2, (pi,3*pi/2), color='blue', fill='axis', fillcolor='blue',␣
 ↪fillalpha=.1)
plt += plot(a0, (-2*pi,2*pi), legend_label='a0', color='purple', linestyle='--')
plt += plot(feven, (-2*pi,2*pi), legend_label='Fourier Cosine Series of f',␣
 ↪color='black')
plt.show()
```

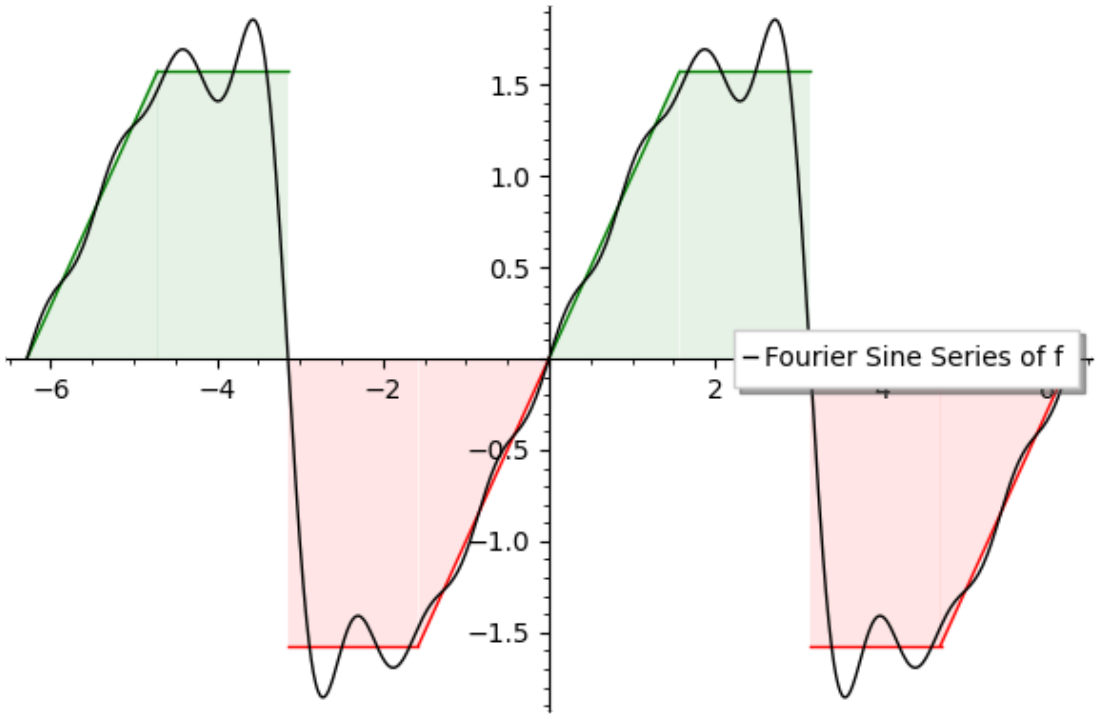


[192]:
```
f1 = x ; f2 = pi/2; f4 = -pi/2
plt = plot([])
plt += plot(f1, (0, pi/2), color='green', fill='axis', fillcolor='green',␣
 ↪fillalpha=.1)
plt += plot(f1, (-pi/2, 0), color='red', fill='axis', fillcolor='red',␣
 ↪fillalpha=.1)
plt += plot(f2, (pi/2,pi), legend_label='f', color='green', fill='axis',␣
 ↪fillcolor='green', fillalpha=.1)
plt += plot(f4, (-pi,-pi/2), legend_label='odd expansion of f',color='red',␣
 ↪fill='axis', fillcolor='red', fillalpha=.1)
plt.show()
```



[191]:
```
f1 = x ; f2 = pi/2; f4 = -pi/2
fodd = (pi+2)*sin(x)/pi - sin(2*x)/2 + (3*pi-2)*sin(3*x)/(9*pi) - sin(4*x)/4 + \
(5*pi+2)*sin(5*x)/(25*pi) - sin(6*x)/6 + (7*pi-2)*sin(7*x)/(49*pi)
plt = plot([])
plt += plot(f1, (0, pi/2), color='green', fill='axis', fillcolor='green',␣
 ↪fillalpha=.1)
plt += plot(f1 + 2*pi, (-2*pi, -3*pi/2), color='green', fill='axis',␣
 ↪fillcolor='green', fillalpha=.1)
plt += plot(f1, (-pi/2, 0), color='red', fill='axis', fillcolor='red',␣
 ↪fillalpha=.1)
plt += plot(f1 - 2*pi, (3*pi/2, 2*pi), color='red', fill='axis',␣
 ↪fillcolor='red', fillalpha=.1)
plt += plot(f2, (pi/2,pi), color='green', fill='axis', fillcolor='green',␣
 ↪fillalpha=.1)
plt += plot(f2, (-3*pi/2,-pi), color='green', fill='axis', fillcolor='green',␣
 ↪fillalpha=.1)
plt += plot(f4, (-pi,-pi/2),color='red', fill='axis', fillcolor='red',␣
 ↪fillalpha=.1)
plt += plot(f4, (pi,3*pi/2),color='red', fill='axis', fillcolor='red',␣
 ↪fillalpha=.1)
plt += plot(fodd, (-2*pi,2*pi), legend_label='Fourier Sine Series of f',␣
 ↪color='black')
```

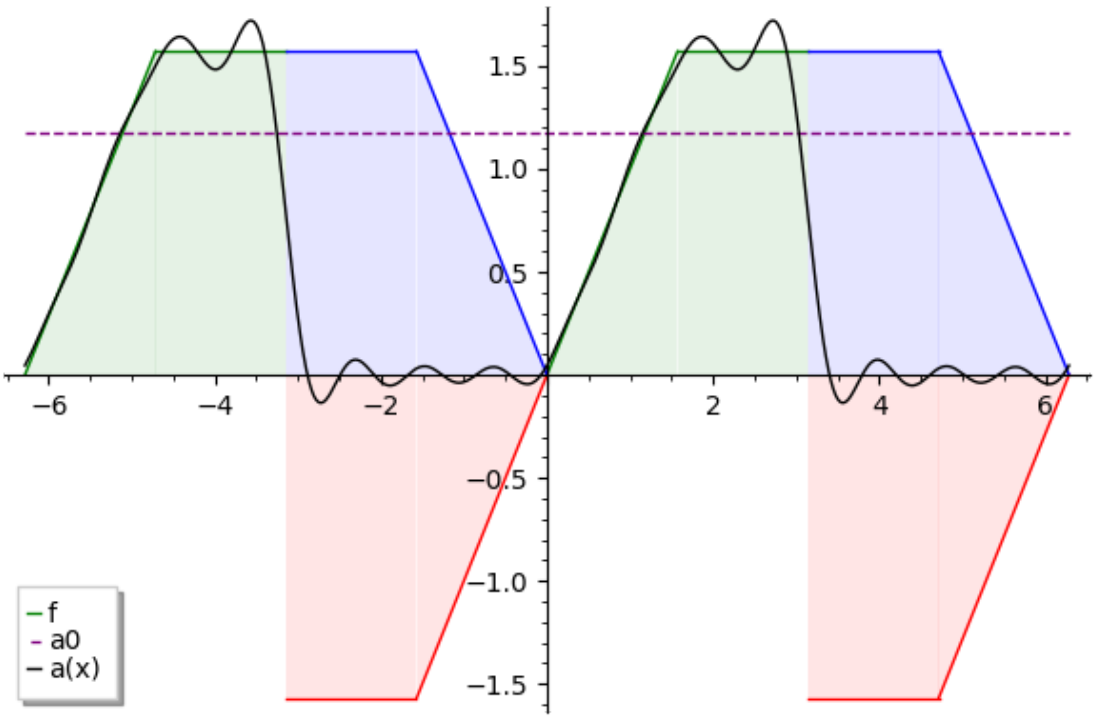
```
plt.show()
```



[205]:
```
f1 = x ; f2 = pi/2; f3 = -x; a0= 3*pi/8; f4 = -pi/2
plt = plot([])
plt += plot(f1, (0, pi/2), color='green', fill='axis', fillcolor='green',␣
 ↪fillalpha=.1)
plt += plot(f1 + 2*pi, (-2*pi, -3*pi/2), color='green', fill='axis',␣
 ↪fillcolor='green', fillalpha=.1)
plt += plot(f1, (-pi/2, 0), color='red', fill='axis', fillcolor='red',␣
 ↪fillalpha=.1)
plt += plot(f1 - 2*pi, (3*pi/2, 2*pi), color='red', fill='axis',␣
 ↪fillcolor='red', fillalpha=.1)
plt += plot(f2, (pi/2,pi), color='green', fill='axis', fillcolor='green',␣
 ↪fillalpha=.1)
plt += plot(f2, (-3*pi/2,-pi), color='green',legend_label='f', fill='axis',␣
 ↪fillcolor='green', fillalpha=.1)
plt += plot(f4, (-pi,-pi/2),color='red', fill='axis', fillcolor='red',␣
 ↪fillalpha=.1)
plt += plot(f4, (pi,3*pi/2),color='red', fill='axis', fillcolor='red',␣
 ↪fillalpha=.1)
plt += plot(f3, (-pi/2, 0), color='blue', fill='axis', fillcolor='blue',␣
 ↪fillalpha=.1)
```

```
plt += plot(f3+(2*pi), (3*pi/2, 2*pi), color='blue', fill='axis',␣
 ↪fillcolor='blue', fillalpha=.1)
plt += plot(f2, (-pi,-pi/2), color='blue', fill='axis', fillcolor='blue',␣
 ↪fillalpha=.1)
plt += plot(f2, (pi,3*pi/2), color='blue', fill='axis', fillcolor='blue',␣
 ↪fillalpha=.1)
plt += plot(a0, (-2*pi,2*pi), legend_label='a0', color='purple', linestyle='--')
plt += plot((feven+fodd)/2, (-2*pi,2*pi), legend_label='a(x)', color='black')

plt.show()
```



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