

? If

If[condition, t, f] gives t if condition evaluates to True, and f if it evaluates to False. If[condition, t, f, u] gives u if condition evaluates to neither True nor False. **More...**

```
f[t_] = If[t < T/2, h, 0];
```

These are rules for assigning numerical values to h and T.

```
r = {h → 3, T → 1};
```

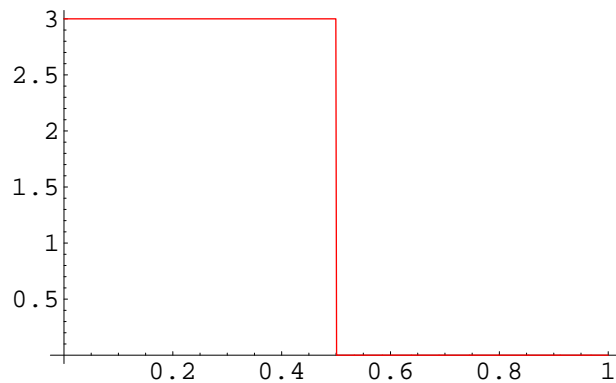
```
rh = {h → 3};
```

```
rt = {T → 1};
```

? RGBColor

RGBColor[red, green, blue] is a graphics directive which specifies that objects which follow are to be displayed, if possible, in the color given. **More...**

```
p1 = Plot[f[t] /. r, {t, 0, T /. r}, PlotStyle → RGBColor[1, 0, 0]];
```



```
w = 2 π / T /. r
```

```
2 π
```

```
a[p_] = 2 / T Integrate[Cos[p w t] f[t], {t, 0, T}] /. rt
```

$$\frac{h \sin[p \pi]}{p \pi}$$

```
a[1]
```

```
0
```

```
a[2]
```

```
0
```

a[0]

Power::infty : Infinite expression $\frac{1}{0}$ encountered. More...

∞ ::indet : Indeterminate expression $\frac{0 \text{ hComplexInfinity}}{\pi}$ encountered. More...

Indeterminate

?Limit

Limit[expr, x->x0] finds the limiting value of expr when x approaches x0. More...

a0 = Limit[a[p], p → 0]

h

b[p_] = 2/T Integrate[Sin[p w t] f[t], {t, 0, T}] /. rt

$$\frac{2 h \sin\left[\frac{p \pi}{2}\right]^2}{p \pi}$$

b[1]

$$\frac{2 h}{\pi}$$

b[2]

0

b[3]

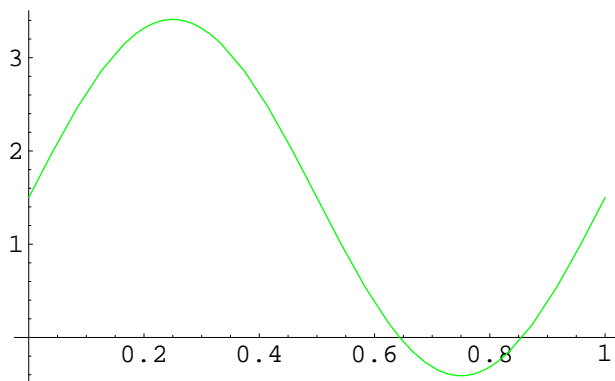
$$\frac{2 h}{3 \pi}$$

b[4]

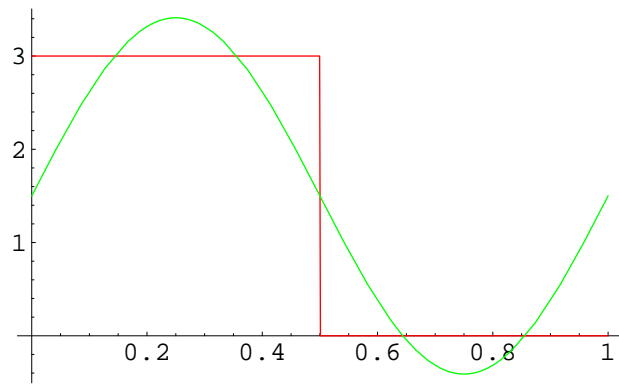
0

g[t_, n_] = a0/2 + Sum[b[p] Sin[p w t], {p, 1, n}];

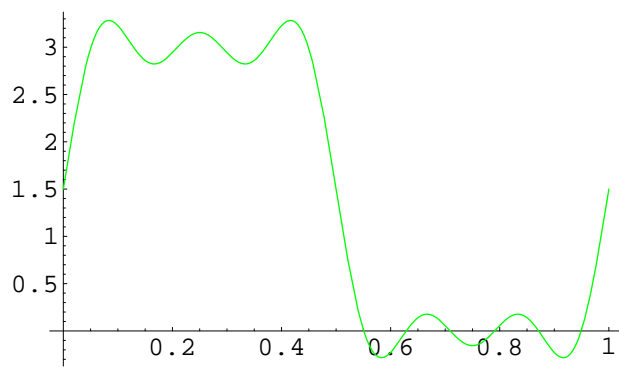
p2 = Plot[g[t, 1] /. r, {t, 0, T/. r}, PlotStyle → RGBColor[0, 1, 0];



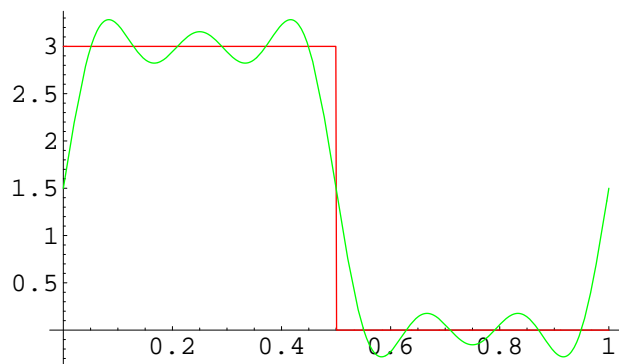
```
Show[p1, p2];
```



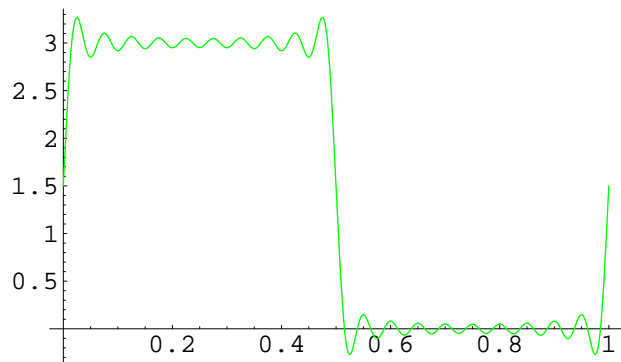
```
p2 = Plot[g[t, 5] /. r, {t, 0, T /. r}, PlotStyle -> RGBColor[0, 1, 0];
```



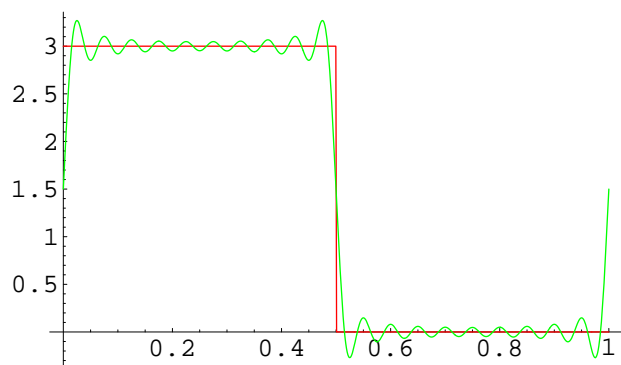
```
Show[p1, p2];
```



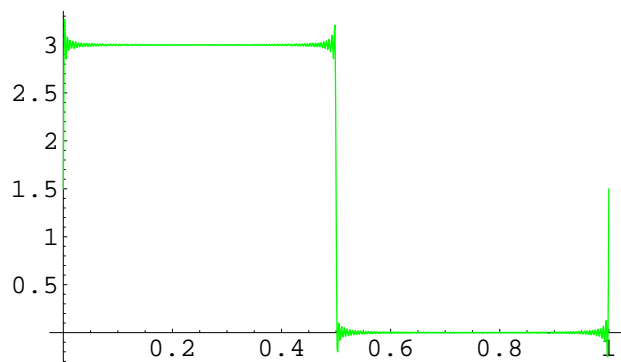
```
p2 = Plot[g[t, 20] /. r, {t, 0, T /. r}, PlotStyle -> RGBColor[0, 1, 0];
```



```
Show[p1, p2];
```



```
p2 = Plot[g[t, 200] /. r, {t, 0, T /. r}, PlotStyle -> RGBColor[0, 1, 0];
```



```
Show[p1, p2];
```

