```
kill(all)$ numer: false$  float: false$ ratprint:false$ solveexplicit:true$ fpprintprec:1
load("engineering-format")$ engineering_format_floats:true$

tperiod: 1/(1400/60.)·2; gtaverage: 0.012; targetmass: tperiod · gtaverage;
```

$$\frac{3}{35}$$

$$12.0\ 10^{-3}$$

$$1.02857142857\ 10^{-3}$$

```
/* fourier series */;

core: 2·%pi·x/tperiod−2·%pi·s/4;
```

$$\frac{70\ \pi\ x}{3} - \frac{\pi\ s}{2}$$

```
/*** f1m: simple positive sine wave i.e. 1 harmonic */;

lift: 0.001$

ftmp1m(A,core):= A·sin(core) + (2·A + lift)/2;
```

$$\text{ftmp1m}\left(A, core\right) := A\ \sin\left(core\right) + \frac{2\ A + lift}{2}$$

```
expftmp1m: ftmp1m(A,core)$

define(f1m(x,A,s),expftmp1m)$

/* f1m: match target mass for unshifted pulse */;

sln1m: solve(targetmass = integrate(f1m(x,A,0), x,0,tperiod), A)$
sfactor1m: A, sln1m$

check1m: float(integrate(f1m(x,sfactor1m,0), x,0,tperiod));
```

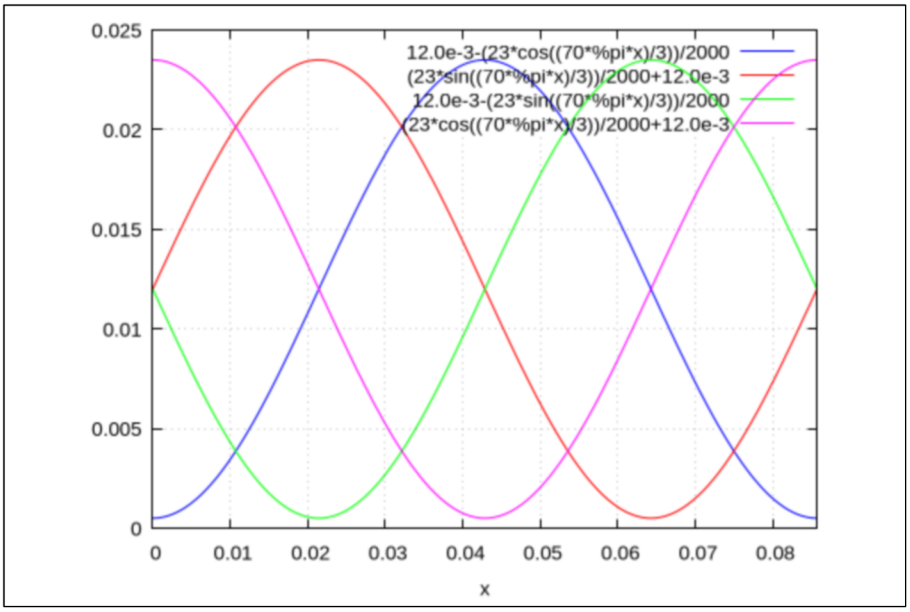
$$1.02857142857\ 10^{-3}$$

```
/*** f3m: rectangular positive pulse w/ 3 harmonics */;

lift: 0.005$
```

```
ftmp3m(A,core) := (A+lift)/2 + 2·A/%pi·( sin(1·core) / 1 + sin(3·core) / 3 + sin(5·cor
```

$$\text{ftmp3m}(A,core):=\frac{A+lift}{2}+\frac{2\,A}{\pi}\left(\frac{\sin(1\,core)}{1}+\frac{\sin(3\,core)}{3}+\frac{\sin(5\,core)}{5}\right)$$

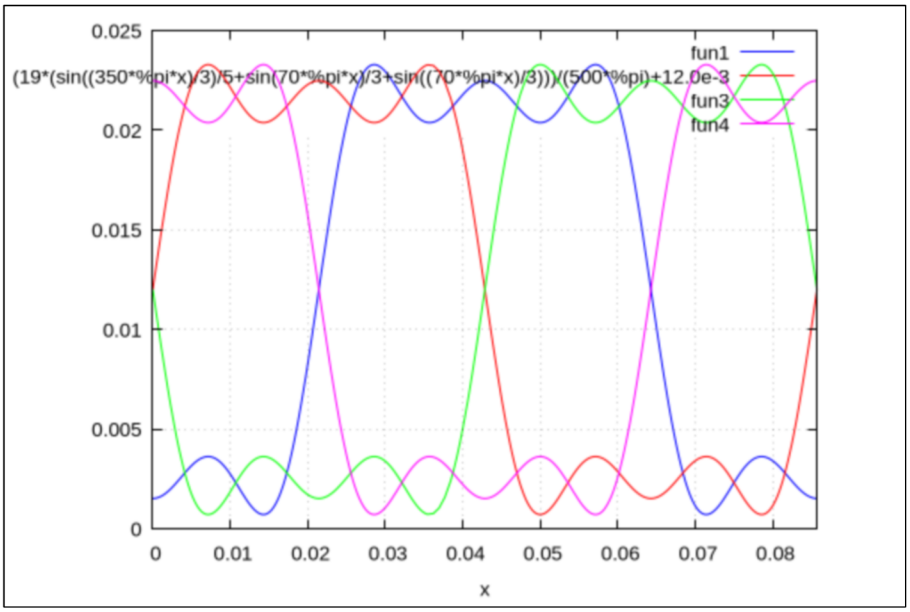
```
expftmp3m: ftmp3m(A,core)$

define(f3m(x,A,s),expftmp3m)$

p1m: []$ p1m: endcons(f1m(x,sfactor1m,1),p1m)$ p1m: endcons(f1m(x,sfactor1m
p1m: endcons(f1m(x,sfactor1m,2),p1m)$ p1m: endcons(f1m(x,sfactor1m,3),p1m)$
wxplot2d( p1m, [x, 0., tperiod],grid2d )$
```




```
/* f3m: match target mass for unshifted pulse */;

sln3m: solve(targetmass = integrate(f3m(x,A,0), x,0,tperiod), A)$
sfactor3m: A, sln3m$

check3m: float(integrate(f3m(x,sfactor3m,0), x,0,tperiod));
```

$$1.02857142857\ 10^{-3}$$

```
p3m: []$ p3m: endcons(f3m(x,sfactor3m,1),p3m)$ p3m: endcons(f3m(x,sfactor3m
p3m: endcons(f3m(x,sfactor3m,2),p3m)$ p3m: endcons(f3m(x,sfactor3m,3),p3m)$
wxplot2d( p3m, [x, 0., tperiod],grid2d )$
```



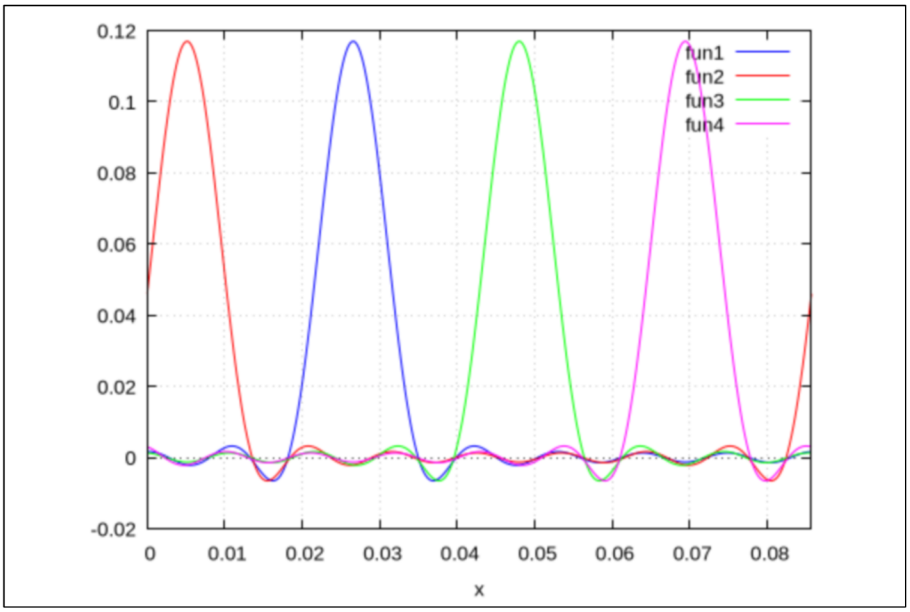

```
/*** f7m: D wide rectangular pulse w/ 7 harmonics */;

D: 0.12$ /* 0.12 */
lift: 0.0$ /* 0.0 */

term(n):= A/(n·%pi)·sin(2·%pi·n·D) ·cos(n·core) + 2·A/(n·%pi)·(sin(%pi·n·D))^2 ·sin(
```

$$\text{term}(n):=\frac{A}{n\,\pi}\sin(2\,\pi\,n\,D)\cos(n\,core)+\frac{2\,A}{n\,\pi}\sin(\pi\,n\,D)^2$$
$$\sin(n\,core)$$

```
ftmp7m(A,core) := (2·A·D+lift)/2 + ( term(1) + term(2) + term(3) + term(4) + term

expftmp7m: ftmp7m(A,core)$

define(f7m(x,A,s),expftmp7m)$

/* f7m: match target mass for unshifted pulse */;

sln7m: solve(targetmass = integrate(f7m(x,A,0), x,0,tperiod), A)$
sfactor7m: A, sln7m$

check7m: float(integrate(f7m(x,sfactor7m,0), x,0,tperiod));
```

$$1.02857142857\ 10^{-3}$$

```
p7m: []$ p7m: endcons(f7m(x,sfactor7m,1),p7m)$ p7m: endcons(f7m(x,sfactor7m
p7m: endcons(f7m(x,sfactor7m,2),p7m)$ p7m: endcons(f7m(x,sfactor7m,3),p7m)$
wxplot2d( p7m, [x, 0., tperiod],grid2d )$
```




```
/* for i:0 thru 3 do
    grind(f7m(x,sfactor7m,i))$ */
```