



```
octave:1> pkg oad symbolic
error: pkg: invalid action. See 'help pkg' for available actions
error: called from
    pkg at line 761 column 7
octave:2> pkg load symbolic
octave:3> syms t
Symbolic pkg v2.9.0: Python communication link active, SymPy v1.5.1.
octave:4> f=2*t+3*t;
octave:5> laplace(f)
ans = (sym)
```

$$\frac{5}{2s}$$

```
octave:6> b=(2/3)*t+t/2;
warning: passing floating-point values to sym is dangerous, see "help sym"
warning: called from
    double_to_sym_heuristic at line 50 column 7
    sym at line 379 column 13
    mtimes at line 63 column 5
```

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octave:7> laplace(b)
ans = (sym)
```

$$\frac{7}{6s^2}$$

```
octave:8> b=(2*t)/3+t/2;
octave:9> laplace(b)
ans = (sym)
```

$$\frac{7}{6s^2}$$

```
octave:10> c=2*exp(-2*t)
c = (sym)
```

$$2e^{-2t}$$

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octave:11> c=2*exp(-2*t);
octave:12> laplace(c)
ans = (sym)
```

$$\frac{2}{s+2}$$

octave:13> d=2*exp(-3*t)+3*t; laplace(d)
ans = (sym)

$$\frac{2}{3 \cdot \left(\frac{s}{-} + 1 \right)} + \frac{3}{s^2}$$

octave:14> d=2*exp(-3*t)+3*t;

octave:15> laplace(d)
ans = (sym)

$$\frac{2}{3 \cdot \left(\frac{s}{-} + 1 \right)} + \frac{3}{s^2}$$

octave:16> e=2*exp(-3*t)+5*exp(=2*t);
error: parse error:

syntax error

>>> e=2*exp(-3*t)+5*exp(=2*t);
^

octave:16> e=2*exp(-3*t)+5*exp(-2*t);

octave:17> laplace(e)
ans = (sym)

$$\frac{7 \cdot s + 19}{(s+2) \cdot (s+3)}$$

octave:18> env
error: 'env' undefined near line 1, column 1

octave:19> echo

octave:20> echo \$a

error: echo: no such file \$a

octave:21> \$a

error: '\$a' undefined near line 1, column 1

octave:22> a

error: 'a' undefined near line 1, column 1

octave:23> syms s

octave:24> F=2/(s+4);

octave:25> ilaplace(F)
ans = (sym)

$$2 \cdot e^{-4 \cdot t}$$

octave:26> B=1/((s+1)*(s+2)); ilaplace(B)
ans = (sym)

$$\begin{pmatrix} t \\ e^{-1} \end{pmatrix} \cdot e^{-2 \cdot t}$$

octave:27> C=3/((s+2)*(s+3)); ilaplace(C)
ans = (sym)

$$\begin{pmatrix} t \\ 3 \cdot e^{-3} \end{pmatrix} \cdot e^{-3 \cdot t}$$

octave:28> D=1/(s+1)+3(s+2); ilaplace(D)
error: subscript indices must be integers or boolean
error: called from
subsindex at line 64 column 5

octave:29> D=1/(s+1)+3/(s+2); ilaplace(D)
ans = (sym)

$$\begin{pmatrix} t \\ e^{-3} \end{pmatrix} \cdot e^{-2 \cdot t}$$

octave:30> E=2/s^2+3/s^3; ilaplace(E)
ans = (sym)

$$\frac{t \cdot (3 \cdot t + 4)}{2}$$

octave:31> F=2/((s+1)*(s+2)*(s+3)); ilaplace(F)
ans = (sym)

$$\begin{pmatrix} 2 \cdot t & t \\ e^{-2} & -2 \cdot e^{-1} + 1 \end{pmatrix} \cdot e^{-3 \cdot t}$$

NOTICE: Due to inactivity, your session will expire in five minutes.

octave:32> pkg load control; syms s

octave:33> pkg load control

octave:34> syms s

octave:35> f=tf([0 3],[1 4]);

octave:36> fz=c2d(f,1,'zoh')

Transfer function 'fz' from input 'u1' to output ...

$$y1: \frac{0.7363}{z - 0.01832}$$

Sampling time: 1 s

Discrete-time model.

octave:37> b=tf([0 2],[1 5 6]); bz=c2d(b,1,'zoh')

Transfer function 'bz' from input 'u1' to output ...

$$y1: \frac{0.2312 z + 0.04268}{z^2 - 0.1851 z + 0.006738}$$

Sampling time: 1 s

Discrete-time model.

octave:38> c=tf([0 3],[1 5 6]); cz=c2d(c,1,'zoh')

Transfer function 'cz' from input 'u1' to output ...

$$y1: \frac{0.3468 z + 0.06402}{z^2 - 0.1851 z + 0.006738}$$

Sampling time: 1 s

Discrete-time model.

octave:39> d=tf([4 5],[1 3 2]); dz=c2d(d,1,'zoh')

Transfer function 'dz' from input 'u1' to output ...

$$y1: \frac{1.929 z - 0.5627}{z^2 - 0.5032 z + 0.04979}$$

Sampling time: 1 s

Discrete-time model.

octave:40> e1=tf([0 2],[1 0 0]); e1z=c2d(e1,1,'zoh')

Transfer function 'e1z' from input 'u1' to output ...

$$y1: \frac{1 z + 1}{z^2 - 2 z + 1}$$

Sampling time: 1 s

Discrete-time model.

octave:41> e2=tf([0 3],[1 0 0 0]); e2z=c2d(e2,1,'zoh')

Transfer function 'e2z' from input 'u1' to output ...

$$y1: \frac{0.5 z^2 + 2 z + 0.5}{z^3 - 3 z^2 + 3 z - 1}$$

Sampling time: 1 s

Discrete-time model.

octave:42> e=e1z+e2z

Transfer function 'e' from input 'u1' to output ...

$$y1: \frac{1.5 z^4 - 1 z^3 - 3 z^2 + 3 z - 0.5}{z^5 - 5 z^4 + 10 z^3 - 10 z^2 + 5 z - 1}$$

Sampling time: 1 s

Discrete-time model.

Connection lost. Attempting to reconnect...

octave:0> f=tf([0 2],[1 3 2]); f=c2d(f,1,'zoh')

Transfer function 'f' from input 'u1' to output ...

$$0.3996 z + 0.147$$

```
y1:  -----  
      z^2 - 0.5032 z + 0.04979
```

Sampling time: 1 s
Discrete-time model.