

# Drugi kolokvijum, 2012, wxMaxima

Zadatak 1

```
(%i1) e1: x1 + 2*x2 + 3*x3 = -5;
```

```
(%o1) 3 x3 + 2 x2 + x1 = - 5
```

```
(%i2) e2: -x1 + x3 = -3;
```

```
(%o2) x3 - x1 = - 3
```

```
(%i3) e3: 3*x1 + x2 + a*x3 = b;
```

```
(%o3) a x3 + x2 + 3 x1 = b
```

1.a

```
(%i4) e3s: ev(e3, a=3, b=-3);
```

```
(%o4) 3 x3 + x2 + 3 x1 = - 3
```

```
(%i5) s: linsolve([e1, e2, e3s], [x1, x2, x3]);
```

```
(%o5) [ x1 = 1 , x2 = 0 , x3 = - 2 ]
```

1.b

```
(%i6) e3r: ev(e3, a=-1);
```

```
(%o6) - x3 + x2 + 3 x1 = b
```

```
(%i7) r: linsolve([e1, e2, e3r], [x1, x2, x3]);
```

```
(%o7) [ ]
```

1.c

```
(%i8) e3t: ev(e3, a=-1, b=5);
```

```
(%o8) - x3 + x2 + 3 x1 = 5
```

```
(%i9) t: linsolve([e1, e2, e3t], [x1, x2, x3]);
```

```
solve: dependent equations eliminated: (3)
```

```
(%o9) [ x1 = %r1 + 3 , x2 = - 2 %r1 - 4 , x3 = %r1 ]
```

Zadatak 2

```
(%i10) kill(all);
(%o0) done

(%i1) eq: s^2+(3-A)*s+1;
(%o1) s (3 - A) + s^2 + 1

(%i2) r: solve(eq, s);
(%o2) [ s = -\frac{\sqrt{A^2 - 6 A + 5} - A + 3}{2}, s = \frac{\sqrt{A^2 - 6 A + 5} + A - 3}{2} ]
```

2.a

```
(%i3) ev(r, A=0);
(%o3) [ s = -\frac{\sqrt{5} + 3}{2}, s = \frac{\sqrt{5} - 3}{2} ]
```

2.b

```
(%i4) ev(r, A=1);
(%o4) [ s = -1, s = -1 ]
```

2.c

```
(%i5) ev(r, A=3);
(%o5) [ s = -%i, s = %i ]
```

2.d

```
(%i6) ev(r, A=5);
(%o6) [ s = 1, s = 1 ]
```

2.e

```
(%i7) limit(r, A, inf);
(%o7) [ s = 0, s = \infty ]
```

Zadatak 3

```
(%i8) kill(all);
(%o0) done
```

```
(%i1) deq: 'diff(y,t,2) + 25 * y = 150 * cos(10*t);
```

$$(\%01) \frac{d^2}{dt^2} y + 25 y = 150 \cos(10 t)$$

3.a

```
(%i2) sode: ode2(deq, y, t);
```

$$(\%02) y = -2 \cos(10 t) + \%k1 \sin(5 t) + \%k2 \cos(5 t)$$

```
(%i3) f: rhs(sode);
```

$$(\%03) -2 \cos(10 t) + \%k1 \sin(5 t) + \%k2 \cos(5 t)$$

```
(%i4) iv: ev(f, t=0);
```

$$(\%04) \%k2 - 2$$

```
(%i5) solve(iv, \%k2);
```

$$(\%05) [\%k2 = 2]$$

```
(%i6) df: diff(f, t);
```

$$(\%06) 20 \sin(10 t) - 5 \%k2 \sin(5 t) + 5 \%k1 \cos(5 t)$$

```
(%i7) div: ev(df, t=0);
```

$$(\%07) 5 \%k1$$

```
(%i8) solve(div, \%k1);
```

$$(\%08) [\%k1 = 0]$$

3.b

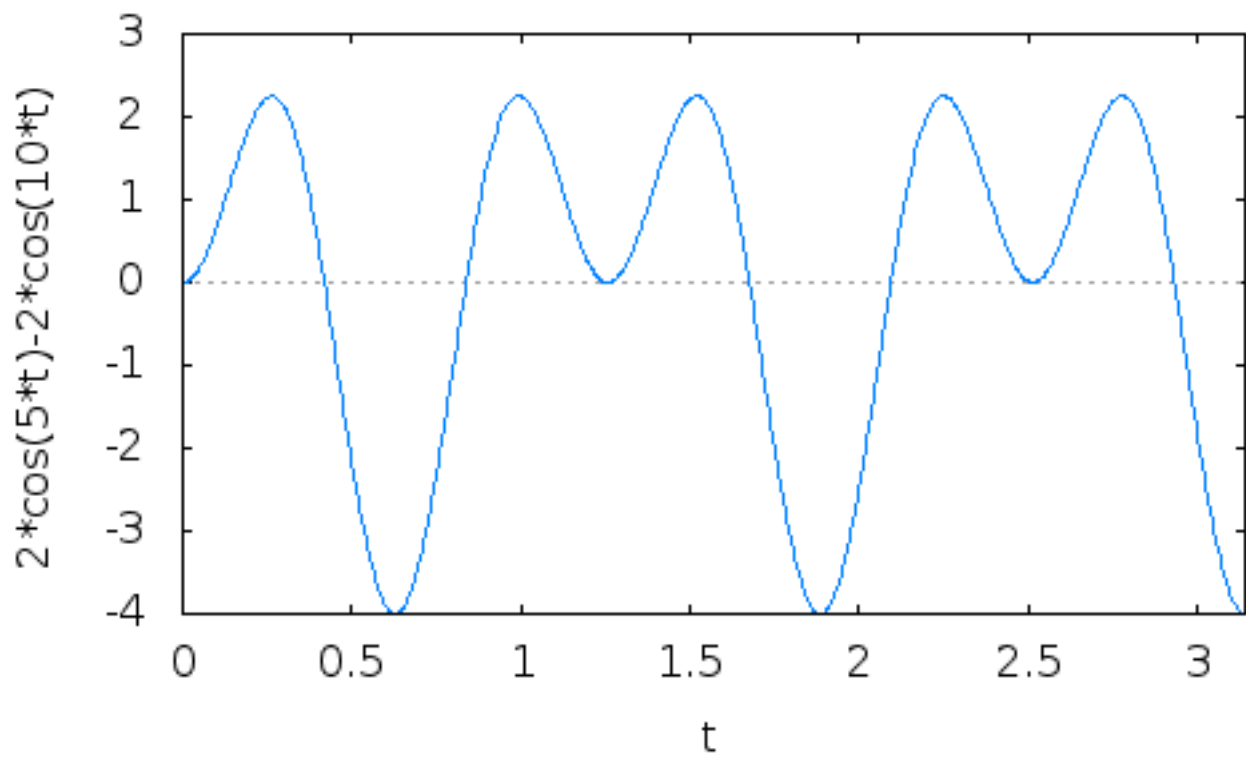
```
(%i9) f: ev(f, \%k1=0, \%k2=2);
```

$$(\%09) 2 \cos(5 t) - 2 \cos(10 t)$$

3.c

```
(%i10) wxplot2d(f, [t, 0, %pi]);
```

```
(%t10)
```



```
(%o10)
```