https://github.com/t-o-k/Maxima-bezier/bezier_curve_3d.wxmx

(%i1)
```
kill(all)$
```

(%i1)
```
load("draw")$
```

(%i2)
```
load("bezier")$
```

(%i3)
```
define(
   curve_x(s),
   bezier_function_1a(matrix([ +0, +2, +6, +5 ]), s)
)$
```

(%i4)
```
define(
   curve_y(s),
   bezier_function_1a(matrix([ +2, -1, +6, +0 ]), s)
)$
```

(%i5)
```
define(
   curve_z(s),
   bezier_function_1a(matrix([ +1, -3, +2, +0 ]), s)
)$
```

(%i6)
```
expand(curve_x(s));
```

(%o6) $-7\,s^3+6\,s^2+6\,s$

(%i7)
```
expand(curve_y(s));
```

(%o7) $-23\,s^3+30\,s^2-9\,s+2$

(%i8)
```
expand(curve_z(s));
```

(%o8) $-16\,s^3+27\,s^2-12\,s+1$

(%i9)
```
define(
   diff_curve_x(s),
   diff(curve_x(s), s)
)$
```

```
(%i10) define(
          diff_curve_y(s),
          diff(curve_y(s), s)
       )$

(%i11) define(
          diff_curve_z(s),
          diff(curve_z(s), s)
       )$

(%i12) expand(diff_curve_x(s));
```

$$-21\,s^2+12\,s+6$$

```
(%i13) expand(diff_curve_y(s));
```

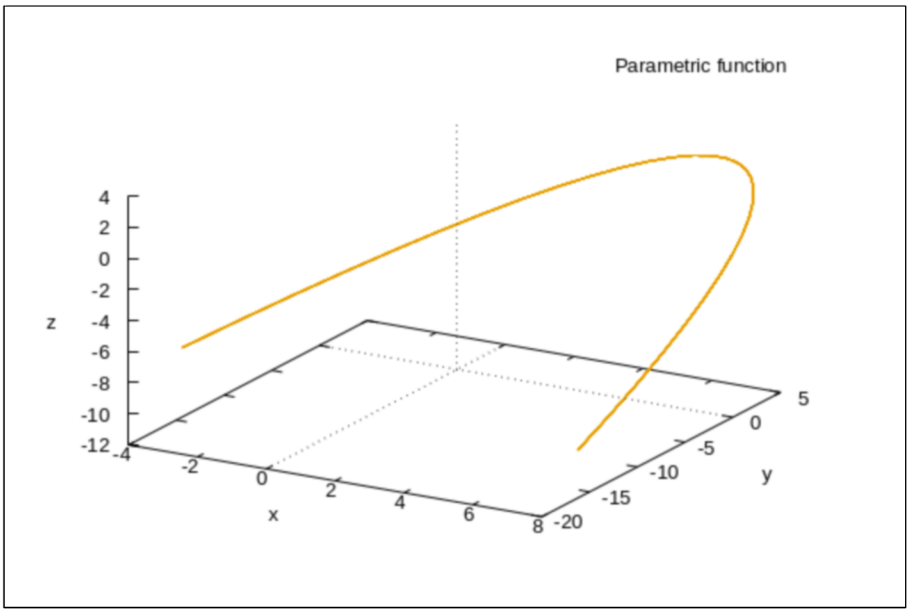
$$-69\,s^2+60\,s-9$$

```
(%i14) expand(diff_curve_z(s));
```

$$-48\,s^2+54\,s-12$$

```
(%i15) wxplot3d(
          [
             diff_curve_x(s),
             diff_curve_y(s),
             diff_curve_z(s)
          ],
          [ s, 0, 1 ],
          [ t, 0, 1 ]
       );
```

(%t15)



(%o15)