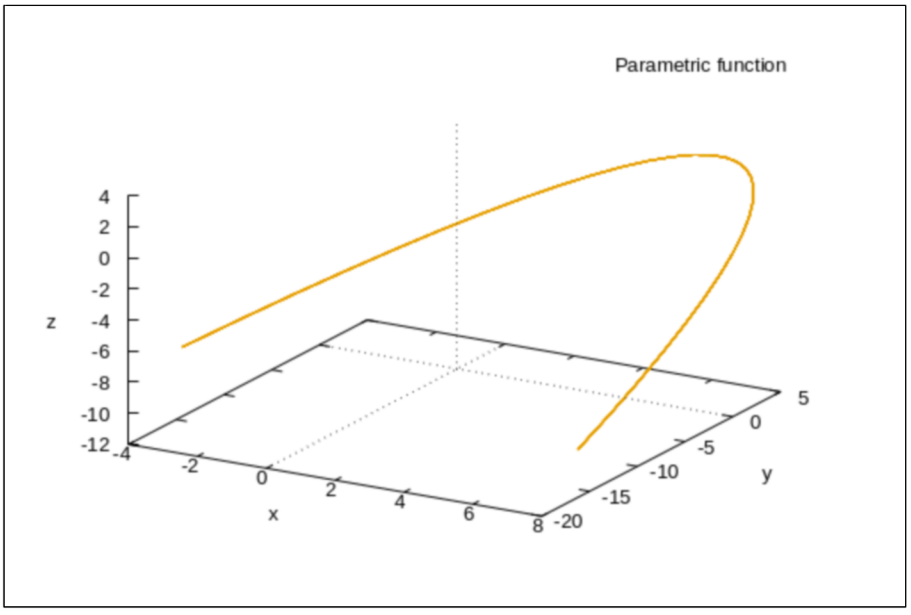
https://github.com/t-o-k/Maxima-bezier/bezier_curve_3d.wxmx


```
(%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));
                          3      2
(%o6)                   − 7 s  + 6 s  + 6 s

(%i7) expand(curve_y(s));
                          3      2
(%o7)                  − 23 s  + 30 s  − 9 s + 2

(%i8) expand(curve_z(s));
                          3      2
(%o8)                  − 16 s  + 27 s  − 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));
                          2
(%o12)                 -21 s  + 12 s + 6

(%i13) expand(diff_curve_y(s));
                          2
(%o13)                 -69 s  + 60 s - 9

(%i14) expand(diff_curve_z(s));
                          2
(%o14)                 -48 s  + 54 s - 12

(%i16) wxplot3d(
           [
               diff_curve_x(s),
               diff_curve_y(s),
               diff_curve_z(s)
           ],
           [ s, 0, 1 ],
           [ t, 0, 1 ]
       );
```

(%t16)



(%o16)