```
(*
Problema:
  Fie curba 𝒸 data ca graficul functiei f:[0,1]→ R, f(x)=2x^2+x+1.
   Sa se gaseasca P0, P1, P2, P3 astfel incat curba Bezier asociata sa fie 𝒸.

  Sa se determine un poligon de control Q0, Q1, Q2, Q3 astfel incat curba Bezier
 corespunzatoare sa aiba racord de clasa C2 cu 𝒸 in P0.

   (Se va considera o diviziune echidistanta!)
*)
```

In[14]:=
```
b[k_] := Binomial[3, k] t^k (1 - t)^(3 - k)
```

In[15]:=
```
P[k_] := {x[k], y[k]}
```

In[26]:=
```
DifBez = Expand[∑_{k=0}^{3} b[k] × P[k] - {t, 2 t^2 + t + 1}] // Simplify
```

Out[26]=
$$\{x[0] + t\,(-1 - 3\,x[0] + 3\,x[1]) + 3\,t^2\,(x[0] - 2\,x[1] + x[2]) + t^3\,(-x[0] + 3\,x[1] - 3\,x[2] + x[3]),$$
$$-1 + y[0] + t\,(-1 - 3\,y[0] + 3\,y[1]) +$$
$$t^2\,(-2 + 3\,y[0] - 6\,y[1] + 3\,y[2]) + t^3\,(-y[0] + 3\,y[1] - 3\,y[2] + y[3])\}$$

In[27]:=
```
For[k = 0, k ≤ 3, k++,
 a[k] = Coefficient[DifBez, t, k]]
```

In[37]:=
```
sol = Solve[{a[0] == 0, a[1] == 0, a[2] == 0, a[3] == 0},
  {x[0], y[0], x[1], y[1], x[2], y[2], x[3], y[3]}]
```

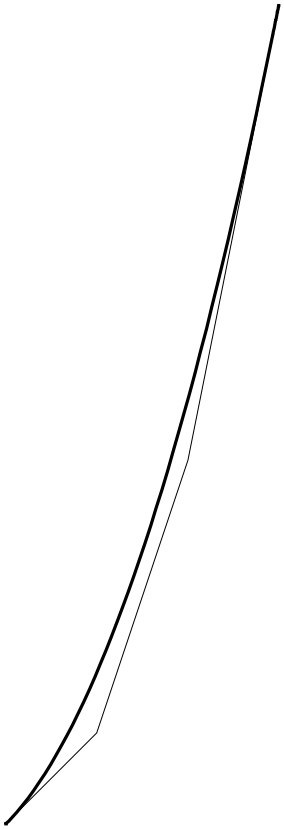
Out[37]=
$$\left\{\left\{x[0] \to 0,\ y[0] \to 1,\ x[1] \to \frac{1}{3},\ y[1] \to \frac{4}{3},\ x[2] \to \frac{2}{3},\ y[2] \to \frac{7}{3},\ x[3] \to 1,\ y[3] \to 4\right\}\right\}$$

In[71]:=
```
BezPol = Graphics[{Black,
    Line[{P[0] /. sol[[1]], P[1] /. sol[[1]], P[2] /. sol[[1]], P[3] /. sol[[1]]}]}];
```

In[72]:=
```
Curb = ParametricPlot[{t, 2 t^2 + t + 1}, {t, 0, 1}, PlotStyle → Black];
```

In[73]:=
```
Show[BezPol, Curb]
```

Out[73]=



In[61]:=
```
p0 = P[0] /. sol[[1]];
p1 = P[1] /. sol[[1]];
p2 = P[2] /. sol[[1]];
p3 = P[3] /. sol[[1]];
```

In[66]:=
```
Q[0] = p0;
Q[1] = 2 Q[0] - p1;
```

In[68]:=
```
d = 2 p1 - p2;
Q[2] = 2 Q[1] - d;
```

In[91]:=
```
Q[3] = {-2, -2};
```

In[92]:=
```
BezPolQ = Graphics[{Magenta, Line[{Q[0], Q[1], Q[2], Q[3]}]}];
```

In[93]:=
```
BezQ = Sum[b[k] × Q[k], {k, 0, 3}];
```

In[94]:=
```
CurbQ = ParametricPlot[BezQ, {t, 0, 1}, PlotStyle → Magenta];
```

In[95]:=
```
Show[BezPol, BezPolQ, Curb, CurbQ]
```

Out[95]=