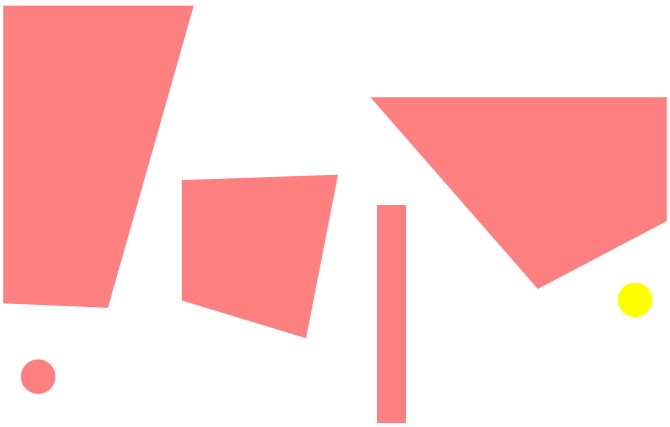
In[189]:=
```
B1 = {{0.0, 4.982}, {0.0, 1.426}, {1.253, 1.371}, {2.278, 4.982}};
B2 = {{2.136, 2.90047}, {2.136, 1.459}, {3.619, 1.011}, {4.002, 2.964}};
B3 = {{4.475, 0.002}, {4.475, 2.601}, {4.812, 2.601}, {4.812, 0.002}};
B4 = {{4.389, 3.891}, {6.389, 1.6}, {7.931, 2.408}, {7.931, 3.891}};

St = {0.42, 0.55} ;
Fin = {7.52, 1.47};
fig1 = Polygon[B1];
fig2 = Polygon[B2];
fig3 = Polygon[B3];
fig4 = Polygon[B4];

col1 = Pink;
col2 = Pink;
col3 = Pink;
col4 = Pink;

g = Graphics[{{col1, fig1}, {col2, fig2}, {col3, fig3},
    {col4, fig4}, {PointSize[0.05], Pink, Point[{0.42, 0.55}]},
    {PointSize[0.05], Yellow, Point[{7.55, 1.47}]}}]
```

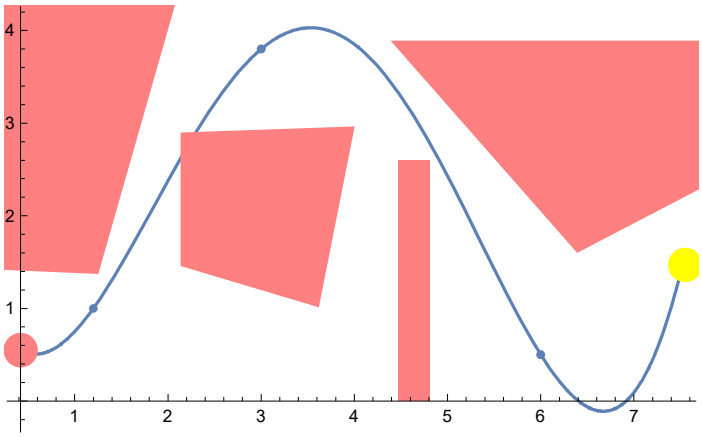
Out[203]=



In[2955]:=

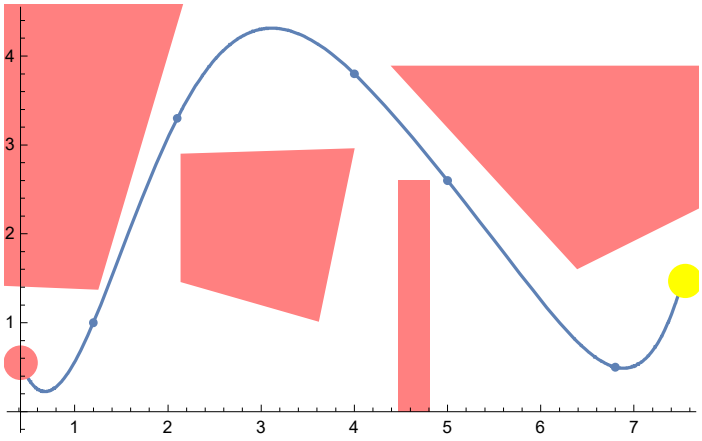
```
(*Решение задачи Ньютоном*)
(*Небольшшое количество точек*)
np = 5;
XX = {{St[[1]], 1.2, 3, 6, Fin[[1]]},
   {St[[2]], 1.0, 3.8, 0.5, Fin[[2]]}}; XX = Transpose[XX] ;
RR = XX;
Do[R = Table[0, {j, np}];
 Do[
  R[[i]] = (RR[[i, k]] - RR[[i - 1, k]]) / (RR[[i, 1]] - RR[[i - k + 1, 1]]);, {i, k, np}];
 RR = Transpose[Append[Transpose[RR], R]];, {k, 2, np}]
RR // N // MatrixForm;
F = RR[[1, 2]] +
    Sum[RR[[i + 1, i + 2]] × Product[x - RR[[j, 1]], {j, 1, i}], {i, 1, np - 1}] // N;
FN = Simplify[F];
ris1 = Plot[F, {x, St[[1]], Fin[[1]]}];
ris2 = ListPlot[XX];
Show[ris1, ris2, g]
```

Out[2964]=



In[2965]:=
```
(*7 точек*)
np = 7;
XX = {{St[[1]], 1.2, 2.1, 4, 5, 6.8, Fin[[1]]},
   {St[[2]], 1.0, 3.3, 3.8, 2.6, 0.5, Fin[[2]]}}; XX = Transpose[XX] ;
RR = XX;
Do[R = Table[0, {j, np}];
 Do[
  R[[i]] = (RR[[i, k]] - RR[[i - 1, k]]) / (RR[[i, 1]] - RR[[i - k + 1, 1]]);, {i, k, np}];
 RR = Transpose[Append[Transpose[RR], R]];, {k, 2, np}]
RR // N // MatrixForm;
F = RR[[1, 2]] +
    Sum[RR[[i + 1, i + 2]] × Product[x - RR[[j, 1]], {j, 1, i}], {i, 1, np - 1}] // N;
FN = Simplify[F];
ris1 = Plot[F, {x, St[[1]], Fin[[1]]}];
ris2 = ListPlot[XX];
Show[ris1, ris2, g]
```

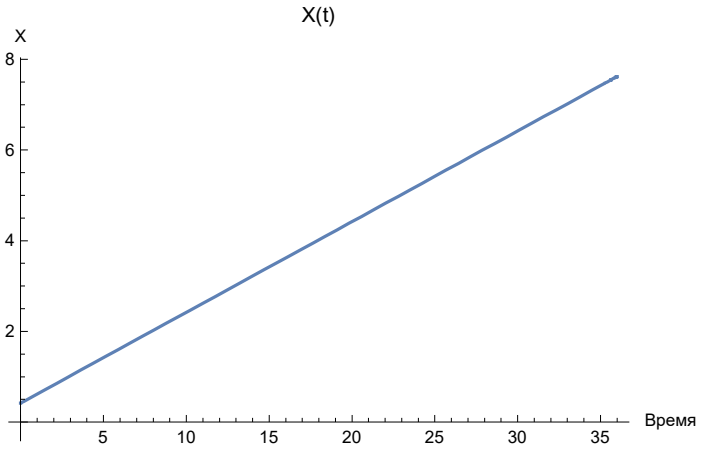
Out[2974]=



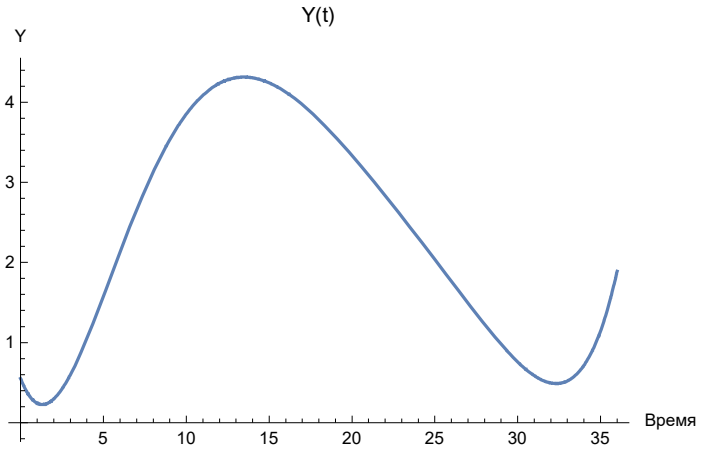
```
(*Пусть Vx(t)=const,
тогда для метода Ньютона зависимости координат от времени будут:*)
Vx = 0.2;
Xt = St[[1]] + Vx * t;
y = F /. (x → Xt);
time = 36
Plot[Xt, {t, 0, time}, AxesLabel → {"Время", "X"}, PlotLabel → "X(t)"]
Plot[y, {t, 0, time}, AxesLabel → {"Время", "Y"}, PlotLabel → "Y(t)"]
```

Out[3115]= 36

Out[3116]=



Out[3117]=



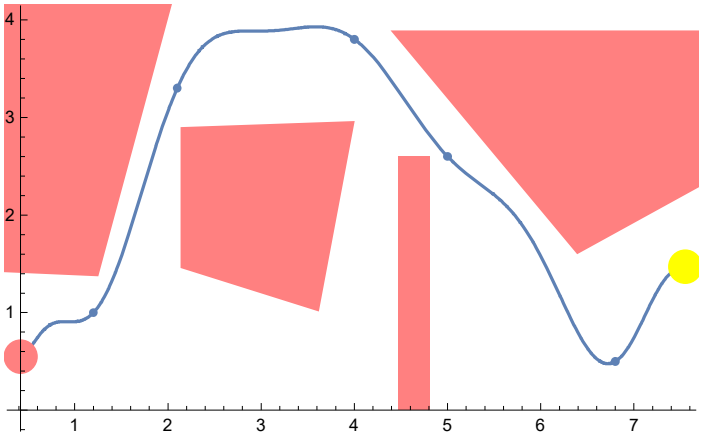
In[2998]:=
```
(*Эрмит*)
np = 14
g1 = Tan[0 Degree];
g2 = Tan[45 Degree];
g3 = Tan[65 Degree];
g4 = Tan[-35 Degree];
g5 = Tan[-45 Degree];
g6 = Tan[30 Degree];
g7 = Tan[20 Degree];
XE = {{St[[1]], St[[1]], 1.2, 1.2, 2.1,
    2.1, 4,    4,    5,    5,  6.8, 6.8, Fin[[1]], Fin[[1]]},
   {  St[[2]], g1,       1.0, g2, 3.3, g3, 3.8, g4, 2.6, g5, 0.5, g6, Fin[[2]], g7}};
XE = Transpose[XE];
RE = XE;
m1 = (XE[[3, 2]] - XE[[1, 2]]) / (XE[[3, 1]] - XE[[1, 1]]);
m2 = (XE[[5, 2]] - XE[[3, 2]]) / (XE[[5, 1]] - XE[[3, 1]]);
m3 = (XE[[7, 2]] - XE[[5, 2]]) / (XE[[7, 1]] - XE[[5, 1]]);
m4 = (XE[[9, 2]] - XE[[7, 2]]) / (XE[[9, 1]] - XE[[7, 1]]);
m5 = (XE[[11, 2]] - XE[[9, 2]]) / (XE[[11, 1]] - XE[[9, 1]]);
m6 = (XE[[13, 2]] - XE[[11, 2]]) / (XE[[13, 1]] - XE[[11, 1]]);
RE = Transpose[Append[Transpose[RE], {0, XE[[2, 2]], m1, XE[[4, 2]], m2, XE[[6, 2]],
      m3, XE[[8, 2]], m4, XE[[10, 2]], m5, XE[[12, 2]], m6, XE[[14, 2]]}]];
Do[Rs = Table[0, {j, np}];
 Do[
  Rs[[i]] = (RE[[i, k]] - RE[[i - 1, k]]) / (RE[[i, 1]] - RE[[i - k + 1, 1]]);, {i, k, np}];
 RE = Transpose[Append[Transpose[RE], Rs]];, {k, 3, np}]
RE // N // MatrixForm;
FE = RE[[1, 2]] +
    Sum[RE[[i + 1, i + 2]] × Product[x - RE[[j, 1]], {j, 1, i}], {i, 1, np - 1}] // N;
FES = Simplify[FE]

ris1 = Plot[FE, {x, St[[1]], Fin[[1]]}];
ris2 = ListPlot[XX];
Show[ris1, ris2, g]
```

Out[2998]= 14

Out[3018]= $10.4857 - 78.7844\,x + 248.519\,x^2 - 411.576\,x^3 + 405.055\,x^4 - 253.268\,x^5 + 105.078\,x^6 - 29.6404\,x^7 + 5.72508\,x^8 - 0.748884\,x^9 + 0.0640595\,x^{10} - 0.00332088\,x^{11} + 0.0000879744\,x^{12} - 7.09217 \times 10^{-7}\,x^{13}$

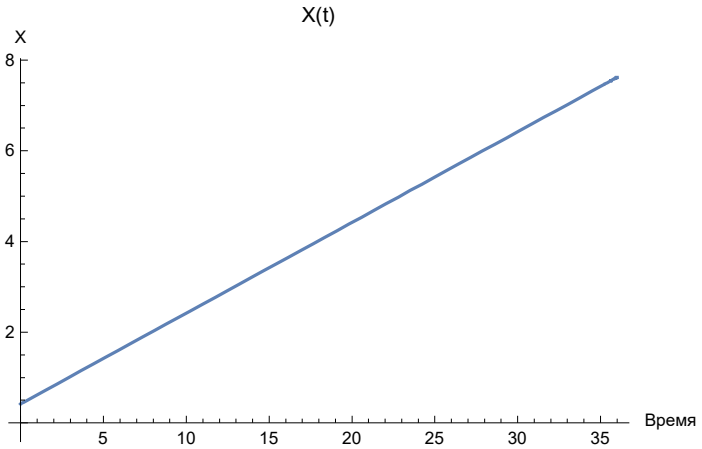
Out[3021]=



In[3118]:=
```
(*Эрмит, зависимости координат от времени:*)
Vx = 0.2;
Xt = St[[1]] + Vx * t;
y = FE /. (x → Xt);
time = 36
Plot[Xt, {t, 0, time}, AxesLabel → {"Время", "X"}, PlotLabel → "X(t)"]
Plot[y, {t, 0, time}, AxesLabel → {"Время", "Y"}, PlotLabel → "Y(t)"]
```

Out[3121]= 36

Out[3122]=



Out[3123]=