```
x:=X(Rationals,"x");
x
p:=x^3-5;
x^3-5
Factors(p);
[ x^3-5 ]
F:=AlgebraicExtension(Rationals,p);
<algebraic extension over the Rationals of degree 3>
q:=x^2+x+1;
x^2+x+1
qF:=Value(q,X(F));
x_1^2+x_1+!1
Factors(qF);
[ x_1^2+x_1+!1 ]
pF:=Value(p,X(F));
x_1^3+(!-5)
Factors(pF);
[ x_1+(-a), x_1^2+a*x_1+a^2 ]
y:=X(Rationals,"y");
y
h:=(x+y)^2+y*(x+y)+y^2;
x^2+3*x*y+3*y^2
r:=Resultant(h,y^3-5,y);
x^6+675
Factors(r);
[ x^6+675 ]
e:=AlgebraicExtension(Rationals,r);
<algebraic extension over the Rationals of degree 6>
pe:=Value(p,X(e));
x_1^3+(!-5)
Factors(pe);
[ x_1+(1/90*a^4-1/2*a), x_1+(-1/45*a^4), x_1+(1/90*a^4+1/2*a) ]


h:=(x-y)^2+x-y+1;
x^2-2*x*y+y^2+x-y+1
r:=Resultant(h,y^3-5,y);
x^6+3*x^5+6*x^4-3*x^3-9*x^2+18*x+36
Factors(r);
[ x^6+3*x^5+6*x^4-3*x^3-9*x^2+18*x+36 ]
```

```
e:=AlgebraicExtension(Rationals,r);
<algebraic extension over the Rationals of degree 6>
pe:=Value(p,X(e));
x_1^3+(!-5)
Factors(pe);
[ x_1+(-1/18*a^5-1/6*a^4-1/3*a^3-1/6*a^2+1/2*a-1),
  x_1+(1/12*a^5+1/6*a^4+1/3*a^3-1/4*a^2+1/2*a+2),
  x_1+(-1/36*a^5+5/12*a^2-a-1) ]
Factors(Value(r,X(e)));
[ x_1+(-1/12*a^5-1/6*a^4-1/3*a^3+1/4*a^2+1/2*a-1),
  x_1+(-1/18*a^5+5/6*a^2-a-1),
x_1+(-1/36*a^5-1/6*a^4-1/3*a^3-7/12*a^2+1/2*a),
  x_1+(-a), x_1+(1/18*a^5+1/6*a^4+1/3*a^3+1/6*a^2+1/2*a+2),
  x_1+(1/9*a^5+1/6*a^4+1/3*a^3-2/3*a^2+1/2*a+3) ]

q;
x^2+x+1
qe:=Value(q,X(e));
x_1^2+x_1+!1
Factors(qe);
[ x_1+(-1/36*a^5+5/12*a^2), x_1+(1/36*a^5-5/12*a^2+1) ]
a:=PrimitiveElement(e);
a
zeta:=1/36*a^5-5/12*a^2;
1/36*a^5-5/12*a^2
zeta^2+zeta+1;
!0
```