```
 ghc --make Main -O2 -fexcess-precision -optc-O3 -optc-ffast-math -fforce-recomp


enter a monic polynomial in X Y (i.e.1 + X Y + 2 X^2 Y - 3 X Y^2 + Y^3)
1+XY+Y^2
State: a^2+1=0
Result: (Y-a+1/2X+1/8aX^2+1/128aX^4+1/1024aX^6+ ...) (Y+a+1/2X-1/8aX^2-1/128aX^4-1/1024aX^6+ ...)


enter a monic polynomial in X Y (i.e.1 + X Y + 2 X^2 Y - 3 X Y^2 + Y^3)
x+Y^2
Main: parse error+x+1Y^2
Bassel-Mannaas-MacBook:src bmannaa$ ./Main
enter a monic polynomial in X Y (i.e.1 + X Y + 2 X^2 Y - 3 X Y^2 + Y^3)
X+Y^2
State: a^2+1=0
Result: (Y-aX^1/2+ ...) (Y+aX^1/2+ ...)


enter a monic polynomial in X Y (i.e.1 + X Y + 2 X^2 Y - 3 X Y^2 + Y^3)
X^3-XY+Y^3
State: a=0,b^2-1=0
Result: (Y-X^2+ ...) (Y-bX^1/2+1/2X^2+ ...) (Y+bX^1/2+1/2X^2+ ...)

State: a^2-1=0,b^2-1/4=0
Result: (Y-aX^1/2+1/2X^2+ ...) (Y+(-b+1/2a)X^1/2+(-3/2ab-1/4)X^2+ ...) (Y+(b+1/2a)X^1/2+(3/2ab-1/4)X^2+ ...)


enter a monic polynomial in X Y (i.e.1 + X Y + 2 X^2 Y - 3 X Y^2 + Y^3)
-1-X+Y^2
State: a^2-1=0
Result: (Y-a-1/2aX+1/8aX^2-1/16aX^3+5/128aX^4-7/256aX^5+21/1024aX^6+ ...) (Y+a
+1/2aX-1/8aX^2+1/16aX^3-5/128aX^4+7/256aX^5-21/1024aX^6+ ...)


enter a monic polynomial in X Y (i.e.1 + X Y + 2 X^2 Y - 3 X Y^2 + Y^3)
-X-X^2+Y^2
State: a^2-1=0
Result: (Y-aX^1/2-1/2aX^3/2+1/8aX^5/2+ ...) (Y+aX^1/2+1/2aX^3/2-1/8aX^5/2+ ...)


enter a monic polynomial in X Y (i.e.1 + X Y + 2 X^2 Y - 3 X Y^2 + Y^3)
-1-3X-3X^2-X^3+Y^3
State: a^3-1=0,b^2+3/4a^2=0
Result: (Y-a-aX+ ...) (Y-b+1/2a+(-b+1/2a)X+ ...) (Y+b+1/2a+(b+1/2a)X+ ...)


enter a monic polynomial in X Y (i.e.1 + X Y + 2 X^2 Y - 3 X Y^2 + Y^3)
-X^2-X^3+Y^2
State: a^2-1=0
Result: (Y-aX-1/2aX^2+1/8aX^3-1/16aX^4+5/128aX^5-7/256aX^6+ ...) (Y+aX
+1/2aX^2-1/8aX^3+1/16aX^4-5/128aX^5+7/256aX^6+ ...)


enter a monic polynomial in X Y (i.e.1 + X Y + 2 X^2 Y - 3 X Y^2 + Y^3)
X-X^3+Y^2
State: a^2+1=0
Result: (Y-aX^1/2+1/2aX^5/2+ ...) (Y+aX^1/2-1/2aX^5/2+ ...)


enter a monic polynomial in X Y (i.e.1 + X Y + 2 X^2 Y - 3 X Y^2 + Y^3)
X^3-X-X^2+Y^2
State: a^2-1=0
Result: (Y-aX^1/2-1/2aX^3/2+5/8aX^5/2+ ...) (Y+aX^1/2+1/2aX^3/2-5/8aX^5/2+ ...)


enter a monic polynomial in X Y (i.e.1 + X Y + 2 X^2 Y - 3 X Y^2 + Y^3)
1+X+2X^2 Y - 3X Y^2+Y^3
State: 151/81a+151/81=0,b^2+3/4=0
Result: (Y-a+(-1/3a-1)X+(1/3a^2+1/9a)X^2+(-1/9a^2-5/81a)X^3+(2/27a^2+10/243a)X^4-20/729X^5+80/6561X^6+ ...) (Y-b+1/2a+
(-1/3b-7/6)X+(4/9b-1/9)X^2+(-4/81b+2/81)X^3+(28/243b-4/243)X^4+(-64/729b+10/729)X^5+(550/6561b-40/6561)X^6+ ...) (Y+b
+1/2a+(1/3b-7/6)X+(-4/9b-1/9)X^2+(14/81b+2/81)X^3+(-28/243b-4/243)X^4+(64/729b+10/729)X^5+(-550/6561b-40/6561)
X^6+ ...)

State: 81/151a^2-81/151a+81/151=0,b^2+3/4a-3/4=0
```

Result: (Y-a+(-1/3a-1)X+(1/3a^2+1/9a)X^2+(-1/9a^2-5/81a)X^3+(2/27a^2+10/243a)X^4+(-64/729a+14/243)
X^5+(550/6561a-35/729)X^6+ ...) (Y-b+1/2a+(-1/3b+1/6a-1)X+(-1/3ab+1/9b-2/9a+1/6)X^2+(1/9ab-5/81b+7/81a-1/18)X^3+
(-2/27ab+10/243b-4/243a+1/27)X^4+(14/243ab-22/729b+32/729a-7/243)X^5+(-35/729ab+235/6561b-275/6561a+35/1458)
X^6+ ...) (Y+b+1/2a+(1/3b+1/6a-1)X+(1/3ab-1/9b-2/9a+1/6)X^2+(-1/9ab+5/81b+7/81a-1/18)X^3+(2/27ab-0/243b-4/243a+1/27)
X^4+(-4/243ab+22/729b+32/729a-7/243)X^5+(35/729ab-235/6561b-275/6561a+35/1458)X^6+ ...)

enter a monic polynomial in X Y (i.e.1 + X Y + 2 X^2 Y - 3 X Y^2 + Y^3)
X^4-1/2 X^3 Y + X^2 Y^2 - 1/2 X Y^3 + Y^5