

Pensieve Header: Plotting 2-variable polynomials.

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Print["Loading PolyPlot.m to plot 2-variable polynomials."]
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Loading PolyPlot.m from <http://drorbn.net/mv26/ap> to plot 2-variable polynomials.

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In[ ]:= Options[PolyPlot1] = {Labeled -> False};
PolyPlot1[Δ_, OptionsPattern[]] := Module[{Δ1, crs, m, maxc, minc, s, rect},
  Δ1 = PowerExpand@Expand@Δ;
  rect = {{0, 0}, {1, 0}, {1, 1}, {0, 1}};
  If[Δ1 === 0, Graphics[],
    m = Max[-Exponent[Δ1, T, Min], Exponent[Δ1, T, Max]];
    crs = CoefficientRules[T^m Δ1, {T}];
    maxc = N@Log@Max@Abs[Last /@ crs];
    minc = N@Log@Min@Select[Abs[Last /@ crs], # > 0 &];
    If[minc == maxc, s[_] = 0, s[c_] := s[c] = (maxc - Log@c) / (maxc - minc)];
    Graphics[crs /. ({x_} -> c_) -> {
      Lighter[Which[c == 0, White, c > 0, Red, c < 0, Blue], 0.88 s[Abs@c]],
      Tooltip[Polygon[({x + m - 1 / 2, 0} + #) & /@ rect], c T^{x-m}],
      If[Not@OptionValue[Labeled], {},
        {Black, FontSize -> Scaled[ $\frac{1}{(m+1)(6+maxc)}$ ], Text[c T^{x-m}, {x + m, 0.5}]}]
    }, AspectRatio -> Min[1 / 5, 1 / Sqrt[m + 1]],
    ImagePadding -> None, PlotRangePadding -> None]
  ];
Options[PolyPlot2] = {Labeled -> False, Shear -> True};
PolyPlot2[θ_, OptionsPattern[]] :=
Module[{θ1, crs, m1, m2, maxc, minc, s, stone, mat, p},
  θ1 = PowerExpand@Expand@θ;
  If[θ1 === 0, Graphics[{White, Disk[]}],
    If[OptionValue[Shear],
      stone = Table[{Cos[α], Sin[α]} / Cos[2 π / 12] / 2, {α, 2 π / 12, 2 π, 2 π / 6}];
      mat =  $\begin{pmatrix} 1 & -1/2 \\ 0 & \sqrt{3}/2 \end{pmatrix}$ ;
      stone = {{1, 1}, {-1, 1}, {-1, -1}, {1, -1}} / 2;
      mat = IdentityMatrix[2];
    ];
    m1 = Max[-Exponent[θ1, T1, Min], Exponent[θ1, T1, Max]];
    m2 = Max[-Exponent[θ1, T2, Min], Exponent[θ1, T2, Max]];
    crs = CoefficientRules[T1^m1 T2^m2 θ1, {T1, T2}];
    maxc = N@Log@Max@Abs[Last /@ crs];
```

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minc = N@Log@Min@Select[Abs[Last /@ crs], # > 0 &];
If[minc == maxc, s[_] = 0, s[c_] := s[c] = (maxc - Log@c) / (maxc - minc)];
Graphics[{{(*{Yellow,Disk[{0,0},1+Cos[2π/12]Norm[{m1,m2}]/√2]}},*)
  crs /. ({x1_, x2_} → c_) ⇒ {
    Lighter[Which[c == 0, White, c > 0, Red, c < 0, Blue], 0.88 s[Abs@c]],
    p = mat.{x1 - m1, x2 - m2};
    Tooltip[Polygon[(p + #) & /@ stone], c T1x1-m1 T2x2-m2],
    If[Not@OptionValue[Labeled], {},
      {Black, FontSize → Scaled[ $\frac{1}{\text{Max}[m1, m2] (10 + \text{maxc})}$ ], Text[c T1x1-m1 T2x2-m2, p]}]}
  }, ImagePadding → None, PlotRangePadding → None]
]];
Options[PolyPlot] = {Labeled → False, ImageSize → Automatic};
PolyPlot[{Δ_, θ_}, opts___Rule] := GraphicsColumn[
  {PolyPlot1[Δ, FilterRules[Join[{opts}, Options[PolyPlot]], Options[PolyPlot1]]],
  PolyPlot2[θ, FilterRules[Join[{opts}, Options[PolyPlot]], Options[PolyPlot2]]]},
  Spacings → Scaled@0.08, ImagePadding → None, PlotRangePadding → None,
  FilterRules[Join[{opts}, Options[PolyPlot]], Options[GraphicsColumn]]
];

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*In[\*]:=* PolyPlot@ $\left\{-1 + \frac{1}{T} + T, -\frac{1}{T_1^2} - T_1^2 - \frac{1}{T_2^2} - \frac{1}{T_1^2 T_2^2} + \frac{1}{T_1 T_2^2} + \frac{1}{T_1^2 T_2} + \frac{T_1}{T_2} + \frac{T_2}{T_1} + T_1^2 T_2 - T_2^2 + T_1 T_2^2 - T_1^2 T_2^2\right\}$

Out[ ]=

