

Pensieve Header: Plotting 2-variable polynomials.

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Print[
  "Loading PolyPlot.m from http://drorbn.net/ktc25/ap to plot 2-variable polynomials."]
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Loading PolyPlot.m from http://drorbn.net/ubc24/ap to plot 2-variable polynomials.

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Options[PolyPlot1] = {Labeled -> False};
PolyPlot1[Δ_, OptionsPattern[]] := Module[{crs, m, maxc, minc, s, rect},
  rect = {{0, 0}, {1, 0}, {1, 1}, {0, 1}};
  If[Expand[Δ] === 0, Graphics[],
    m = Max[-Exponent[Δ, T, Min], Exponent[Δ, T, Max]];
    crs = CoefficientRules[T^m Δ, {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/√(m+1)],
    ImagePadding -> None, PlotRangePadding -> None]
  ]];
Options[PolyPlot2] = {Labeled -> False};
PolyPlot2[θ_, OptionsPattern[]] := Module[{crs, m1, m2, maxc, minc, s, hex, p},
  If[Expand[θ] === 0, Graphics[{{White, Disk[]}}],
    hex = Table[{Cos[α], Sin[α]} / Cos[2π/12] / 2, {α, 2π/12, 2π, 2π/6}];
    m1 = Max[-Exponent[θ, T1, Min], Exponent[θ, T1, Max]];
    m2 = Max[-Exponent[θ, T2, Min], Exponent[θ, T2, Max]];
    crs = CoefficientRules[T1^m1 T2^m2 θ, {T1, T2}];
    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[{{(*{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 =  $\begin{pmatrix} 1 & -1/2 \\ 0 & \sqrt{3}/2 \end{pmatrix} \cdot \{x1 - m1, x2 - m2\}$ ;
        Tooltip[Polygon[(p + #) & /@ hex], c T1^{x1-m1} T2^{x2-m2}],
      }
    }
  ]];
```

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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]
]];
PolyPlot[{\Delta, \theta}, opts__Rule] := GraphicsColumn[
  {PolyPlot1[\Delta, FilterRules[{opts}, Options[PolyPlot1]]],
  PolyPlot2[\theta, FilterRules[{opts}, Options[PolyPlot2]]]},
  Spacings -> Scaled@0.08, ImagePadding -> None, PlotRangePadding -> None,
  FilterRules[{opts}, Options[GraphicsColumn]]
];

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In[*]:= PolyPlot@{-1 + $\frac{1}{T}$ + T, - $\frac{1}{T_1^2}$ - T₁² - $\frac{1}{T_2^2}$ - $\frac{1}{T_1^2 T_2^2}$ + $\frac{1}{T_1 T_2^2}$ + $\frac{1}{T_1^2 T_2}$ + $\frac{T_1}{T_2}$ + $\frac{T_2}{T_1}$ + T₁² T₂ - T₂² + T₁ T₂² - T₁² T₂²}

Out[*]=

