

Pensieve header: Not solving the quintic in MAT 1750 - background matter.

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SetDirectory["C:\\drorbn\\AcademicPensieve\\2015-04\\Commutators"];
PRoot[name_, a_, n_] := PRoot[name, n] = If[NumberQ[PRoot[name, n]],
  MinimalBy[N[a1/n] Table[e2πik/n, {k, n}], Abs[# - PRoot[name, n]] &][[1],
  a1/n];
InputBackground = Graphics[{Pink, Disk[], Red, Point[{0, 0}],
  Table[{Line[{{t, -1}, {t, 1}], Line[{{-1, t}, {1, t}]}], {t, -1, 1, 2/3}]}];
OutputBackground = {LightBlue, Disk[], Blue, Point[{0, 0}],
  Table[{Line[{{t, -1}, {t, 1}], Line[{{-1, t}, {1, t}]}], {t, -1, 1, 2/3}],
  Black};
Pt@c_ := {Re[c], Im[c]};

Import["Commutators-Handout_800.png"]

Decommute = p[j_, k_, m_] => Module[{i, l},
  {i, l} = Complement[Range[5], {j, k, m}];
  c[p[i, j, k], p[k, l, m]];
Format[p[i_, j_, k_]] := "(" <> ToString[i] <> ToString[j] <> ToString[k] <> ")";
Format[c[a_, b_]] := "[" <> ToString[a] <> ", " <> ToString[b] <> "]";
Column[{p[2, 3, 5] /. Decommute, dc = p[1, 2, 3] /. Decommute,
  dc = dc /. Decommute, dc = dc /. Decommute, dc = dc /. Decommute}]

Button["Play", SystemOpen["../2015-01/Commutators/SwordFight.mp4"]]

Module[{λ1, λ2, x, a, b, c, Δ, δ, r},
  {λ1, λ2} = {{1, 1}/2, {1, -1}/2};
GraphicsGrid[Partition[#, 3] & @ {
  LocatorPane[Dynamic[{λ1, λ2}], InputBackground, Appearance -> {"λ1", "λ2"}],
  Dynamic[Graphics[{OutputBackground,
    {c, b, a} = CoefficientList[(x - {1, i}.λ1) (x - {1, i}.λ2), x];
    Text["a", {Re[a], Im[a]}],
    Text["b", {Re[b], Im[b]}], Text["c", {Re[c], Im[c]}]
  }, PlotRange -> All, PlotLabel -> "(x-λ1)(x-λ2)=ax2+bx+c"]],
  Dynamic[Graphics[{OutputBackground,
    Δ = b2 - 4 a c; Text["Δ", {Re[Δ], Im[Δ]}]
  }, PlotRange -> All, PlotLabel -> "Δ=b2-4ac"]],
  Dynamic[Graphics[{OutputBackground,
    δ = PRoot["Δ[2]", Δ, 2]; Text["δ", {Re[δ], Im[δ]}]
  }, PlotRange -> All, PlotLabel -> "δ=√Δ "]],
  Dynamic[Graphics[{OutputBackground,
    r = (-b + δ) / (2 a); Point[{Re[r], Im[r]}]
  }, PlotRange -> All, PlotLabel -> "r=(-b+δ)/(2a)"]],
  Null }]]

```