

Pensieve header: Three Peano curves.

? PeanoCurve

PeanoCurve[n] gives the line segments representing the  $n^{\text{th}}$ -step Peano curve. >

## Peano Curve #1

## Peano Curve #2

```

Peano[0] = DLine[{{0, 0}, {1, 1}}];
Peano[n_] := Peano[n - 1] /. DLine[{{x0_, y0_}, {x1_, y1_}}] => {
  dx = x1 - x0; dy = y1 - y0;
  DLine[{{x0, y0}, {x0 + 1/2 dx, y0 + 1/2 dy}}],
  Line[{{x0 + 1/2 dx, y0 + 1/2 dy}, {x0 + 1/2 dx, y0}}],
  DLine[{{x0 + 1/2 dx, y0}, {x0 + dx, y0 + 1/2 dy}}],
  Line[{{x0 + dx, y0 + 1/2 dy}, {x0, y0 + 1/2 dy}}],
  DLine[{{x0, y0 + 1/2 dy}, {x0 + 1/2 dx, y0 + dy}}],
  Line[{{x0 + 1/2 dx, y0 + dy}, {x0 + 1/2 dx, y0 + 1/2 dy}}],
  DLine[{{x0 + 1/2 dx, y0 + 1/2 dy}, {x0 + dx, y0 + dy}}]
};
GraphicsRow@Table[Graphics[Peano[n] /. DLine -> Line], {n, 0, 3}]

AlmostPeano[0] = DLine[{{0, 0}, {1, 1}}];
AlmostPeano[n_] := AlmostPeano[n - 1] /. DLine[{{x0_, y0_}, {x1_, y1_}}] => {
  dx = x1 - x0; dy = y1 - y0;
  DLine[{{x0, y0}, {x0 + 0.45 dx, y0 + 0.45 dy}}],
  Line[{{x0 + 0.45 dx, y0 + 0.45 dy}, {x0 + 0.55 dx, y0}}],
  DLine[{{x0 + 0.55 dx, y0}, {x0 + dx, y0 + 0.45 dy}}],
  Line[{{x0 + dx, y0 + 0.45 dy}, {x0, y0 + 0.55 dy}}],
  DLine[{{x0, y0 + 0.55 dy}, {x0 + 0.45 dx, y0 + dy}}],
  Line[{{x0 + 0.45 dx, y0 + dy}, {x0 + 0.55 dx, y0 + 0.55 dy}}],
  DLine[{{x0 + 0.55 dx, y0 + 0.55 dy}, {x0 + dx, y0 + dy}}]
};
GraphicsRow@Table[Graphics[AlmostPeano[n] /. DLine -> Line], {n, 0, 3}]

Graphics[AlmostPeano[5] /. DLine -> Line]

```

## Peano Curve #3

```

γ[t_List] := Prepend[
  FromDigits[{-#, 0}, 2] & /@ Transpose[Partition[t, 2]],
  FromDigits[{2 t, 0}, 3]
];
Graphics3D[
  Line[γ /@ Tuples[{0, 1}, 14]],
  ViewPoint -> {-370.06, 733.124, 570.6}, ViewVertical -> {0.1792, 0.789508, -0.599889}
] // Rasterize

```