

Steps in constructing the Limaçon of Pascal

- Set the Straightedge Tool to “Line tool” (to draw an “infinite” line)
- Press and hold down the SHIFT button to help you to draw a horizontal line with the Tool
- Select and then Hide the two points used in constructing this line – This prevents the line from moving from its horizontal orientation
- Construct 3 random points on the (infinite) line
- Label these points C, F and R
- Set Line Style to “Thick Lines” and set the Straightedge Tool to “Segment tool”
- Draw the segment CF
- Set Line Style to “Dashed Lines” and with the Compass tool construct a circle, centre F, radius FR
- Construct a point on this circle
- Label this point K
- Select the circle (To be called “The Generating Circle”)
- From the Edit Menu choose Action Button and then choose Hide/Show
- Press and hold down the SHIFT Button and select point K and then the circumference of the generating circle
- From the Edit Menu choose Action Button and then choose Animation
- From the “Path Match” dialogue box select the required speed – “Normally” is fine and click the “Animate” Button
- Press and hold down the SHIFT Button and select points C, K and F in this order
- Run the “crostrap.gss” script. This will draw an isosceles trapezium through the points C, K and F and will also give the 4th point in this trapezium
- Label this 4th point in the isosceles trapezium as point D
- Make the line segments CD, KD and FK thick by setting the Line Style to “Thick Lines”
- Construct a point anywhere on the line segment KD
- Label this point E
- Press and hold down the SHIFT Button and select points C, E and D in this order
- Run the “crostrap.gss” script. This will draw an isosceles trapezium through the points C, E and D and will also give the 4th point in this trapezium
- Label this 4th point in the isosceles trapezium as point G
- Make the line segment EG thick by setting the Line Style to “Thick Lines”
- (Notice now that the trapeziums CDKF and CGED will be similar – it’s a nice little proof to do)
- Set Line Style to “Dashed Lines”
- Construct, using the Compass tool in the Toolbox, a circle with centre C and radius CD
- Set the Straightedge Tool to “Ray tool”
- Draw a ray from C through G. This ray should extend through the circle CD
- Construct the point of intersection of the ray and the circle.
- Label this point of intersection as point H
- Hide both the ray and the circle
- Hide the line segment CG
- Set Line Style to “Thick Lines” and set the Straightedge Tool to “Segment tool”
- Draw the line segment CH
- Set Line Style to “Dashed Lines” and set the Straightedge Tool to “Line tool”
- Draw a segment between points H and D
- With the Selection Arrow tool, shaped like an arrow (The Translate tool), double click on the segment HD – This will prepare it to become a mirror line
- Press and hold down the SHIFT button and select segments CH and CD and also the point C
- From the Transform Menu choose *Reflect* (This Reflection is the CRITICAL step that allows the full range of correct movement for the linkage)

