

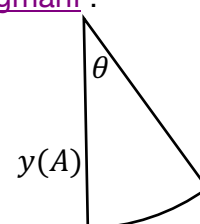
GeoGebra Tutorial: Area of a Circle

No.	Command	Remarks
1.	<code>cir=Circle((0,1),1)</code>	
2.	<code>n=Slider(3,100,1)</code>	
3.	<code>k=Slider(0,2,0.01)</code>	
4.	<code>s=If(k<1,k,1)</code>	
5.	<code>t=If(k<1,0,k-1)</code>	
6.	<code>A=(0,1/(1-s))</code>	See ** below.
7.	<code>circumPoints=Sequence(Rotate((0,0),pi*(1-s)i/n,A),i,-n,n)</code>	
8.	<code>centrePoints=Sequence(Intersect(Circle(circumPoints(i),1),Circle(circumPoints(i+1),1)),i,1,2n)</code>	
9.	<code>sector=Sequence(CircularSector(centrePoints(i),circumPoints(i),circumPoints(i+1)),i,1,2n)</code>	See Figure 1.
10.	<code>circumStraight=Sequence((-pi+pi*i/n,0),i,0,2n)</code>	
11.	<code>centreStraight=Sequence(Intersect(Circle(circumStraight(i),1),Circle(circumStraight(i+1),1)),i,1,2n)</code>	
12.	<code>sectorL=Sequence(CircularSector(centreStraight(i),circumStraight(i),circumStraight(i+1)),i,1,n)</code>	
13.	<code>sectorR=Reflect(sectorL,yAxis)</code>	See Figure 2.
14.	<code>sectorRotateL=Rotate(sectorL,-(180t)°,Midpoint(centreStraight(n+1),(0,0)))</code>	
15.	<code>SetConditionToShowObject(sectorR,k>=1)</code>	
16.	<code>SetConditionToShowObject(sectorRotateL,k>=1)</code>	
17.	Hide circumPoints, centrePoints, circumStraight, centreStraight, sectorL and point A. Hide axes and grid.	See Figure 3.
18.	Adjust the colors, opacity, line thickness, etc as you like. Add a text instruction. Press Ctrl+Shift+D to toggle "Selection Allowed" for all objects except points and lists. Uncheck "Selection Allowed" for the four lists of sectors.	See Figure 4.

A more sophisticated version of this applet is available on <https://ggbm.at/tmWgmahf>.

** We want when $s = 0$, $\theta = \pi$; when $s = 1$, $\theta = 0$. We choose $\theta = \pi(1 - s)$.

Also $y(A) * \theta = \pi$, which is half of the circumference. So $y(A) = 1/(1 - s)$.



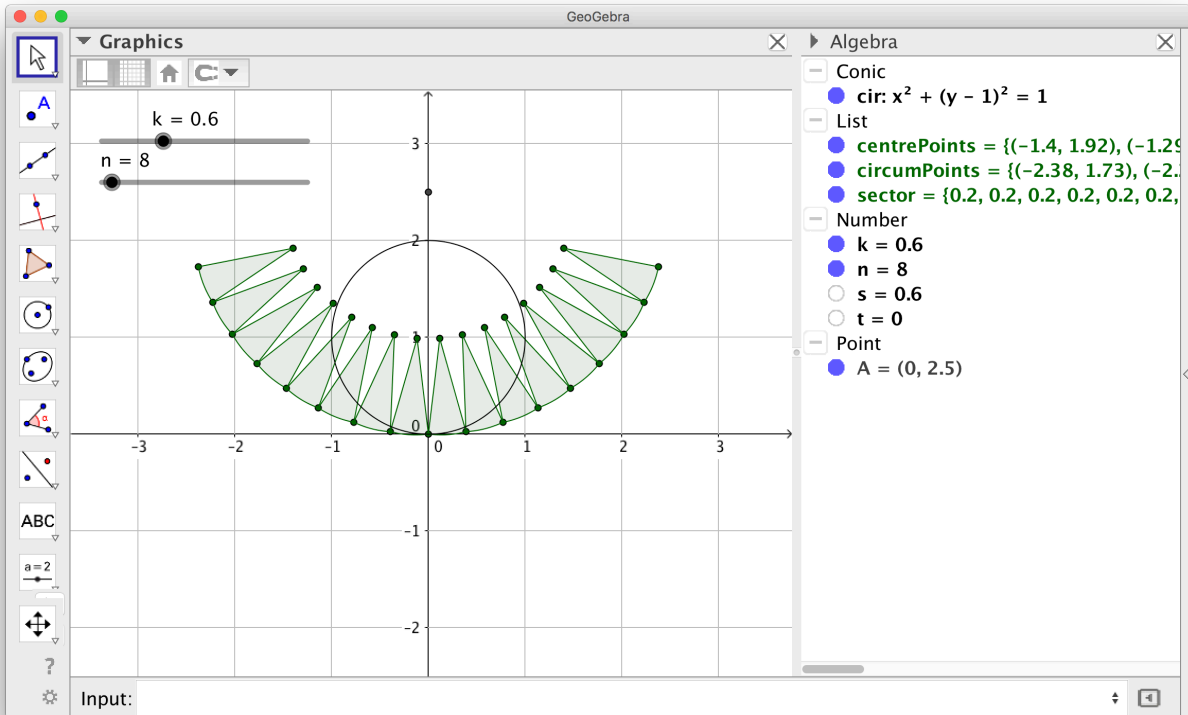


Figure 1

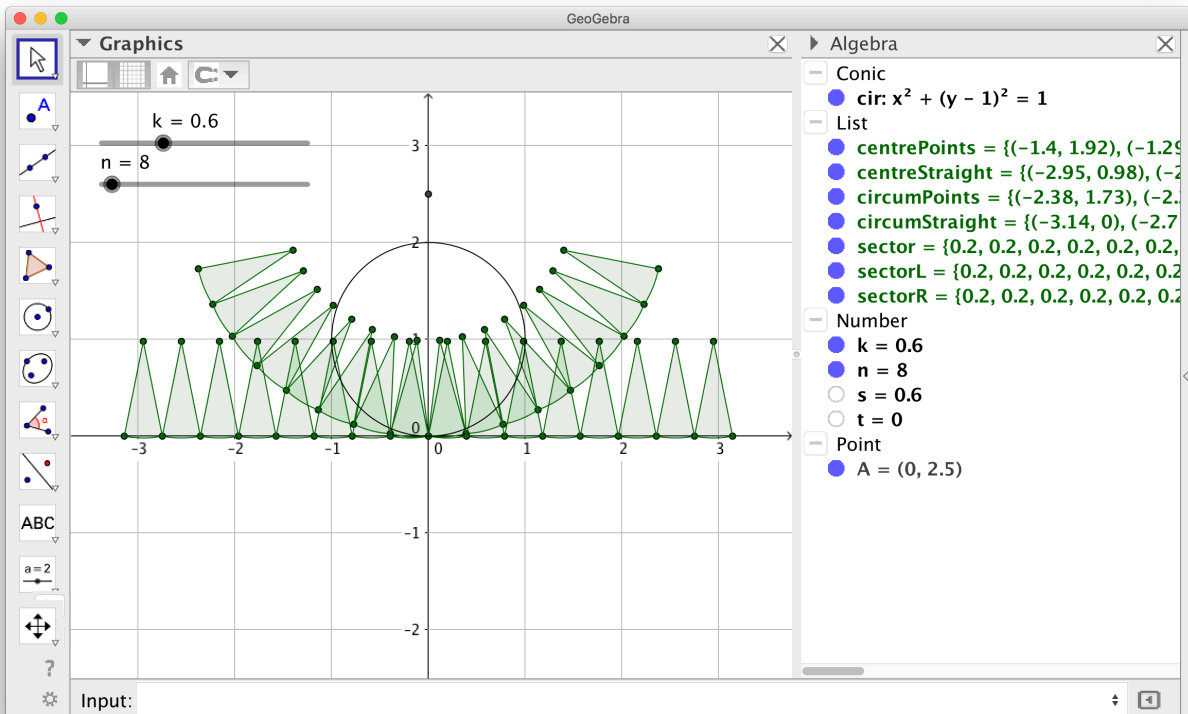


Figure 2

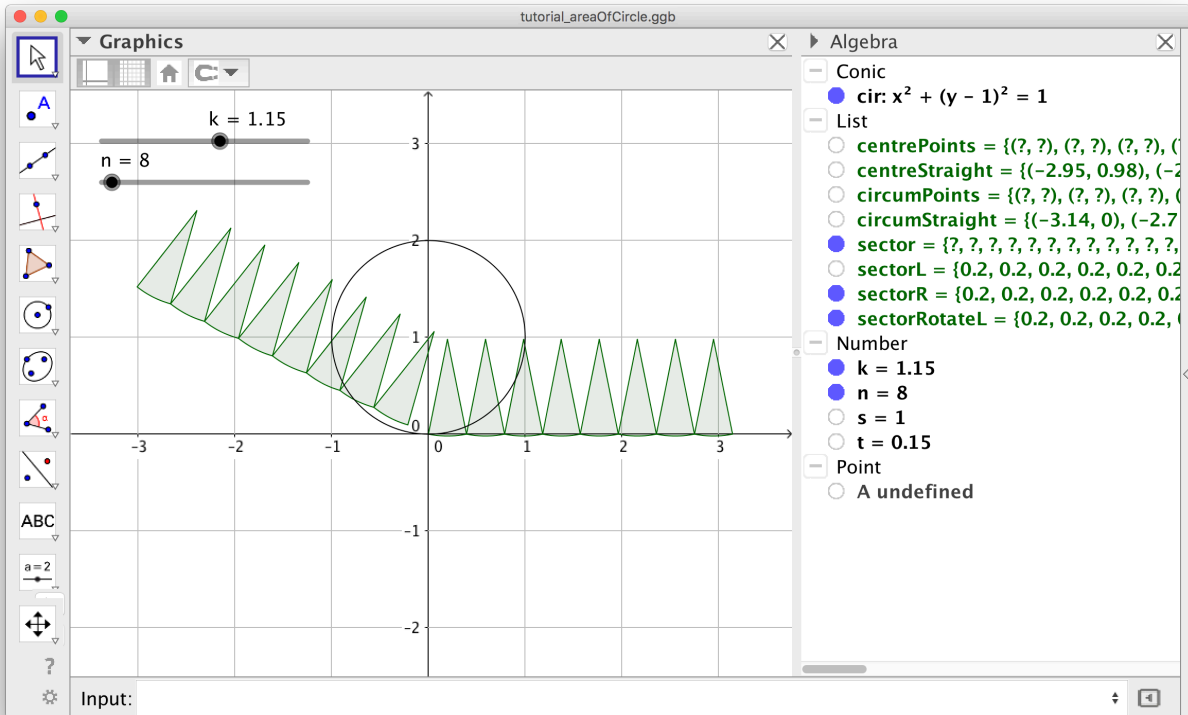


Figure 3

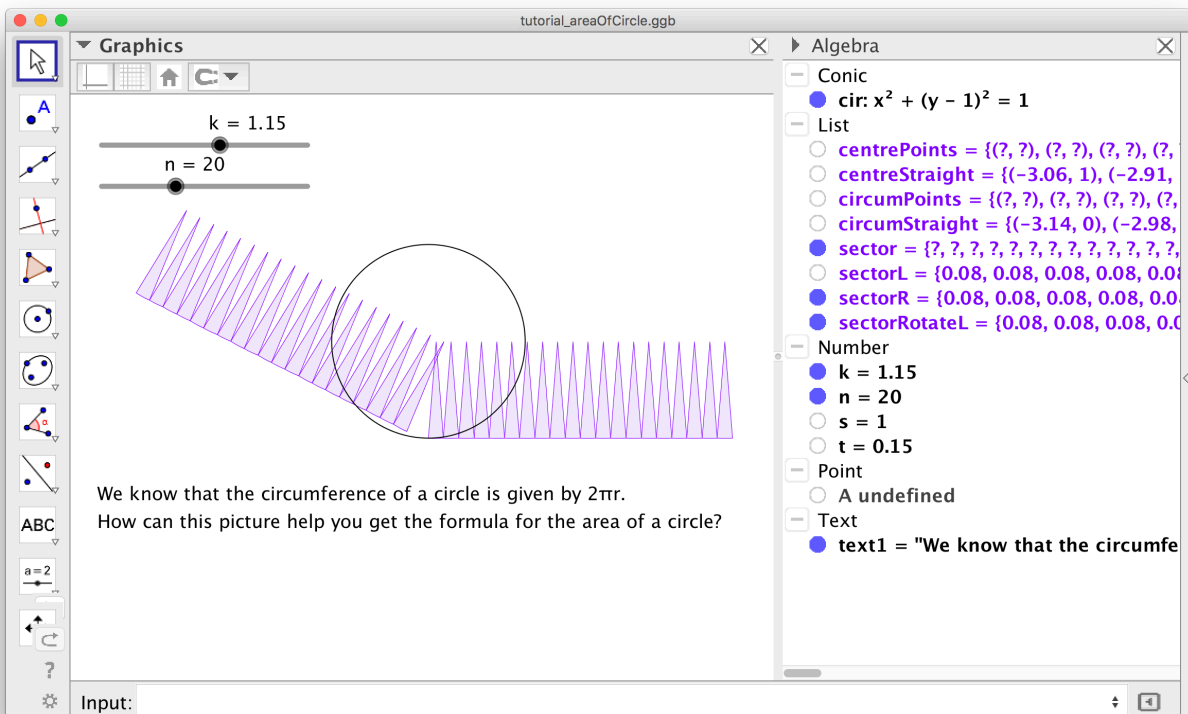


Figure 4