Instructions for Epicycloids Geogebra Worksheet

To find parametric equations for an epicycloid, check the "show auxiliary objects" box. Assume

(a) the radius of the fixed circle is a

(b) the radius of the rolling circle is b

Let $\angle AOB = t$ and $\angle OAP = s$. Note that because of the rolling, the two orange arcs have the same length, so $at = bs$.

Follow the following steps to come up with equations for the x and y coordinates of P in terms of the parameter t.

1. Express $\angle OAB$ in terms of t.

2. Express $\angle DAP$ in terms of s and t.

3. $x = OC = OB + BC$. You should be able to express OB and BC in terms of t and/or s by looking at right triangles OBA and ADP. Then since $at = bs$, you should be able to express x in terms of just t (and of course a and b).

4. $y = CP = AB - AD$, so you should be able to express y in terms of t, a, and b.

Once you have your equations, enter them into the input boxes and click the "Graph parametric equations" button to verify your answers.