Name: _____ Date: _____

How to Do Page 99 #30 Using *Geogebra*

1. Create a circle with a radius of 5 cm.

- Click on the New Point icon ⬚. Click on the origin to create point A. (If the axes are not

  visible, click on View and select Axes.)

- To rename point A, click the Select Icon ⬚ and double click on point A.

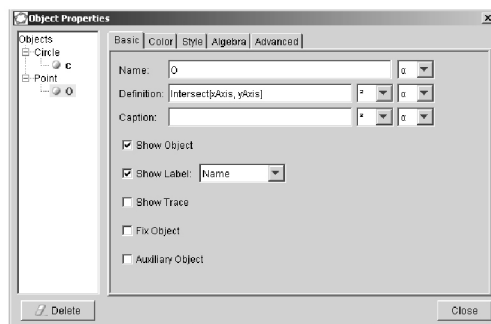- Click Object Properties and name
  the point O. See Figure 1.

Figure 1

- To make the circle, click on the small arrow in the circle icon ⬚ .
- Click on Circle With Center and Radius.
- Click on point O. Enter 5 for the radius.

- Click on the Move Drawing Pad icon ⬚ . Drag the circle so that it can be seen completely.

2. Create a point A on the circle and a radius OA.
- Click on the New Point icon and then click on the circle to create point A.

- Click on the small arrow in Line Segment icon ⬚ . Choose Segment Between Two Points.

- Click on point O and then point A.

3. Animate a point on the circle.
  - Click on the slider icon. Then, click a location where you want to insert the slider.
  - In the resulting window, choose angle, name the slider α (using the drop-down menu), and under the animation tab, select increasing and then click Apply. See Figure 2.
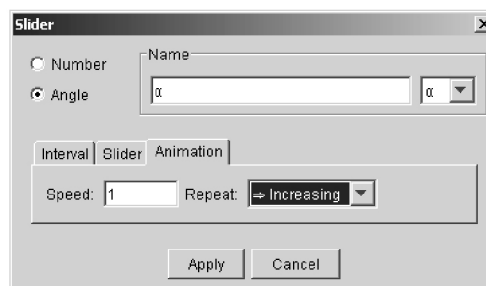
Figure 2

  - Click the small arrow in the Angle icon. Select Angle with Given Size.

  - Click on point A and then point O. Delete the 45 degrees and name the angle α (use the drop-down menu). See Figure 3.
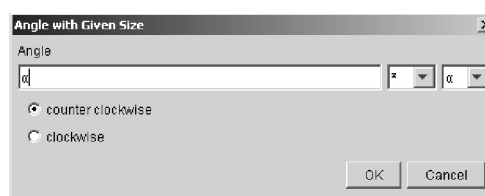   This will create a point A′.

Figure 3

  - If you move the slider, A′ rotates around the circle and creates an angle β as shown in Figure 4. To hide β, on the left side of the screen click on the small circle beside β. See Figure 4. (If the objects are not shown on the left screen, click View and select Algebra View.) See Figure 54.
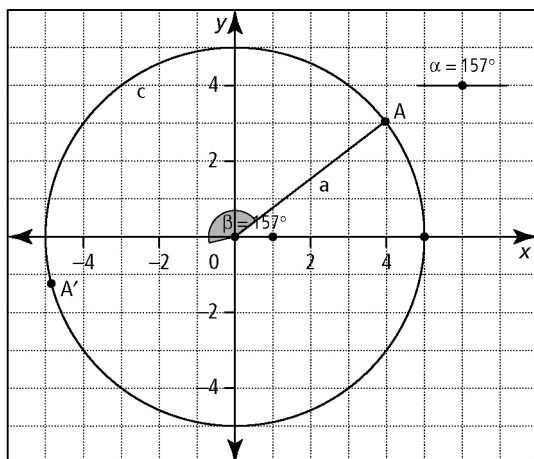
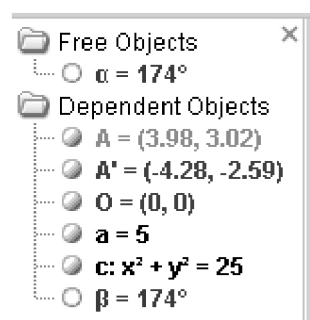**Figure 4**   **Figure 5**

  - Right click on alpha and select Animate On. Once animate is on, you can pause and play the motion using the button that appears in the bottom left corner of the screen. You may wish to hide the slider by clicking on the small circle beside α (on the left side of the screen). The play arrow will remain.

4. Record the coordinates of point A′.
   • On the input line at the bottom of the screen enter x(A′). Then, on the input line enter y(A′). This creates variable, b, for the *x*-coordinate of A′ and variable, d, for the *y*-coordinate of A′.

5. Calculate trigonometric ratios.
   • On the input line, enter b/a, which is the ratio for cosine. (a represents the length of the radius.)
   • Enter d/a on the input line (sine ratio).
   • On the input line enter d/b (tangent ratio). To change the name of each variable, double-click on it, select Object properties and change the name to the corresponding trigonometric ratio as shown in Figure 6.
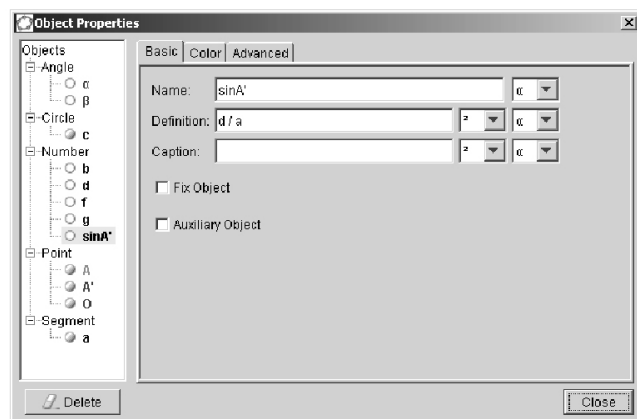

Figure 6

6. Calculate $\frac{\sin A}{\cos A}$.

   • On the input line enter sinA′/cosA′.
   • To change the name of the resulting variable in the left screen, double-click on it, select Object properties and change the name to sindivcos. See Figure 7.
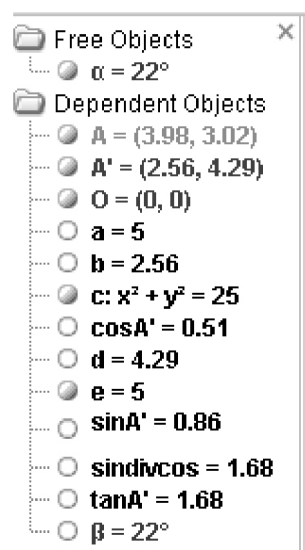

Figure 7