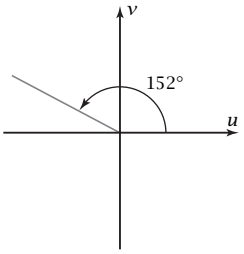
Name: _____ Group Members: _____

Exploration 2-2a: Reference Angles

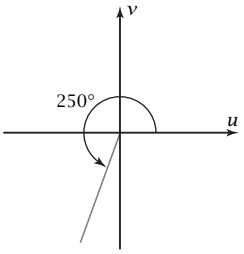
Date: _____

Objective: Learn about measures of angles in standard position and their reference angles.

1. The figure shows an angle, $\theta = 152°$, in **standard position**. The **reference angle**, θ_{ref}, is measured *counterclockwise* between the terminal side of θ and the nearest side of the horizontal axis. Show that you know what *reference angle* means by drawing θ_{ref} and calculating its measure.



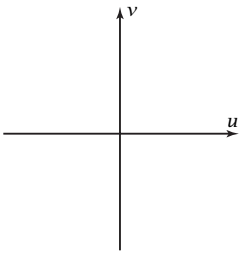
2. The figure shows $\theta = 250°$. Sketch the reference angle and calculate its measure.



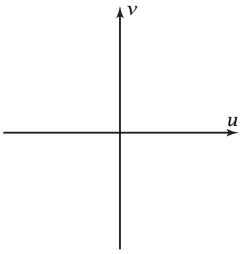
3. You should have drawn arrowheads on the arcs for the reference angles in Problems 1 and 2. If you haven't, draw them now. Explain why the arc for 152° goes from the terminal side to the *u*-axis but the arc for 250° goes from the *u*-axis to the terminal side.

4. Amos Take thinks the reference angle for 250° should go to the *v*-axis because the terminal side is closer to it than the *u*-axis. Tell Amos why his conclusion does not agree with the definition of *reference angle* in Problem 1.

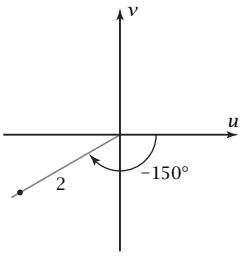
5. Sketch an angle of 310° in standard position. Sketch its reference angle and find the measure of the reference angle.



6. Sketch an angle whose measure is between 0° and 90°. What is the reference angle of this angle?



7. The figure shows an angle of −150°. Sketch the reference angle and find its measure.



8. The figure in Problem 7 shows a point 2 units from the origin and on the terminal side of the angle. Draw a segment from this point perpendicular to the *u*-axis, thus forming a right triangle whose hypotenuse is 2 units long. Use what you recall from geometry to find the lengths of the two legs of the triangle.

9. What did you learn as a result of doing this Exploration that you did not know before?