

LESSON PLAN
JANE CONNOR AND BRENDA MARTIN

USING SIMILAR TRIANGLES TO FIND TRIG RATIOS

OBJECTIVE: Students will demonstrate knowledge of the trig ratios, sine, cosine and tangent.

PROCEDURE: Students will use *Geometer's Sketchpad* to discover trig ratios using worksheet.

EVALUATION: Students will complete *Geometer's Sketchpad* lab using worksheet.

WV IGO'S :

G.11 9,10,11 using trigonometric ratios, determine lengths of sides and measures of angles in right triangles

T.16 use a scientific calculator to find the values of the trigonometric functions for an angle, and the measure of an angle given its trigonometric functions (T.4)

LAB

1. Construct a right triangle.

- Construct a line segment \overline{AB} .
- Construct a line through point B perpendicular to \overline{AB} .
- Construct \overline{AC} , where point C is a point on the perpendicular line.
- Hide the line.
- Construct \overline{BC} to finish the right triangle.
- Show the three segments' labels and change the labels to match the figure above.
- Measure $\angle CAB$.
- Measure the ratios a) opposite/hypotenuse b) adjacent/hypotenuse, and c) opposite/adjacent.
- Drag point C to change the angles. When the angles change, is there a change in the ratios?

- Drag point A or point B to scale the triangle. When the angles don't change, is there a change in the ratios?
- Write an explanation about the changes, if any, you notice in the ratios.

2. Using your calculator, compare ratios that you discover using Geometer's Sketchpad to the sine, cosine and tangent ratios that you find on your calculator.

- Drag point C so that $\angle A$ measures as close to 60° as possible. Write approximate values for the trig ratios, sine, cosine and tangent below.
- Cosine 60° _____ Sine 60° _____ Tangent 60° _____
- Compare the ratios you discovered with the values on your calculator.

3. Complete Step 2 for the following angles:

- 45°
- 75°

References: *Exploring Geometry* by Key Curriculum Press

Interesting Web Sites:

http://www.thinkquest.org/library/lib/site_sum_outside.html?tname=2647&url=2647/index.html (This is an interesting site dealing with extensive geometry and trigonometry applications.)

<http://www.thewizardofodds.com/math/> (Challenging math problems.)

<http://www.iit.edu/~smile/mathinde.html> (Short math lessons on a variety of math topics.)