Just In Time Quick Check
Standard of Learning (SOL) G.5b

Strand: Triangles

Standard of Learning (SOL) G.5b

The student, given information concerning the lengths of sides and/or measures of angles in triangles, will solve problems, including practical problems. This will include ordering the angles by degree measure, given side lengths.

Grade Level Skills:

- Given information about the lengths of sides and/or measures of angles in triangles, solve problems, including practical problems.
- Order the angles of a triangle by their measures when given information about the lengths of the sides.

Just in Time Quick Check

Just in Time Quick Check Teacher Notes

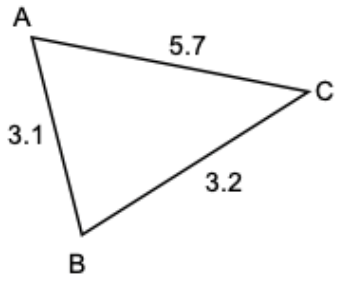
Supporting Resources:

- VDOE Mathematics Instructional Plans (MIPS)
  - G.5a-d – How Many Triangles? (Word) / PDF Version
- VDOE Word Wall Cards: Geometry (Word) | (PDF)
  - Classifying Triangles by Sides
  - Classifying Triangles by Angles
  - Angle and Side Relationships
- Other VDOE Resources
  - Geometry, Module 4, Topic 1 – Ordering the Sides and Angles of a Triangle [eMediaVA]

Supporting and Prerequisite SOL: N/A

SOL G.5b - Just in Time Quick Check

1. Three sprinkler heads are placed on a lawn at each vertex of a triangular pattern shown. Order the angles that are formed by the triangular pattern from smallest to largest angle using the blanks provided. The figure is not drawn to scale.

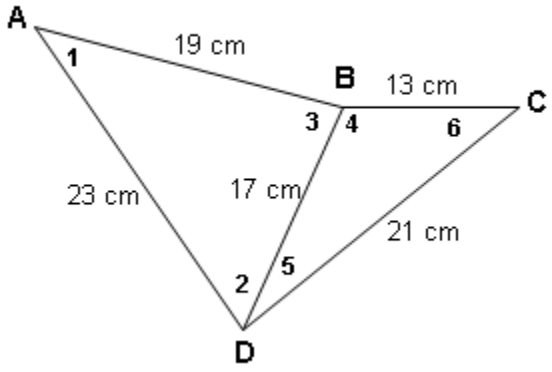


_____ , _____ , _____

2. Three stages at a music festival are arranged in a triangle. The distances between the centers of each stage are given:
   - Stage A and Stage B: 100 yards
   - Stage B and Stage C: 135 yards
   - Stage C and Stage A: 210 yards

   List the interior angle measures formed at the center of each stage in descending order.

3. Jonya and Mikel are trying to determine the smallest angle in this figure. Jonya thinks that $\angle 5$ is the smallest. Mikel thinks that $\angle 1$ is the smallest. Who is correct? Explain your thinking. The figure is not drawn to scale.

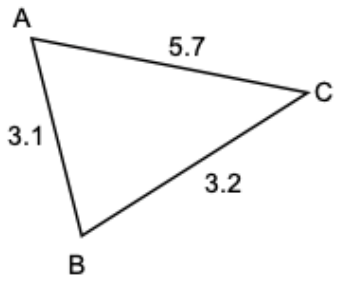


4. ΔPQR has a perimeter of 48 cm. $\overline{PQ} = x$, $\overline{QR} = \frac{4}{3}\overline{PR}$, and $\overline{PR} = \frac{3}{5}\overline{PQ}$. List the interior angle measures of ΔPQR, ordered from greatest to least.

SOL G.5b – Just in Time Quick Check Teacher Notes

Common Errors/Misconceptions and their Possible Indications

1. Three sprinkler heads are placed on a lawn at each vertex of a triangular pattern shown. Order the angles that are formed by the triangular pattern from smallest to largest angle using the blanks provided. The figure is not drawn to scale.



_____ , _____ , _____

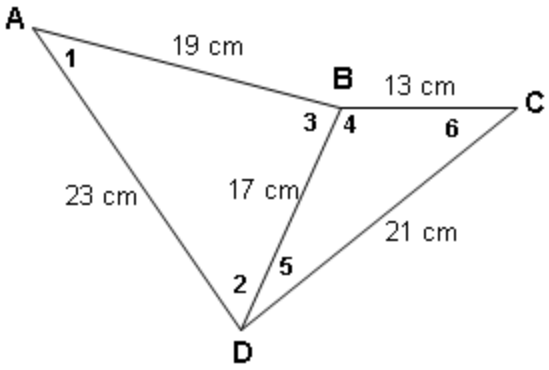
The common error students may make is to list the sides in the order from smallest to largest $\overline{AB}, \overline{BC}, \overline{AC}$. This may indicate that students do not recognize the angle that is opposite each side of the triangle. Teachers are encouraged to demonstrate this concept using color-coded diagrams while going over examples with students, such as using the same color to outline the smallest side and angle, etc. Students may benefit from teachers drawing an arrow from a side to the opposite angle so that they may visualize any angle and its opposite side. Teachers may wish to reinforce the use of appropriate geometric notation (e.g., writing $\angle A, \angle B, and\ \angle C$ instead of A, B, C to represent angles).

2. Three stages at a music festival are arranged in a triangle. The distances between the centers of each stage are given:
   - Stage A and Stage B: 100 yards
   - Stage B and Stage C: 135 yards
   - Stage C and Stage A: 210 yards

   List the interior angle measures formed at the center of each stage in descending order.

A common error students may make is to list the angles from smallest to largest. This may indicate that students do not understand the meaning of descending vs. ascending. Teachers may consider using visual aids (such as arranging straws with various lengths) or kinesthetic activities (such as asking students to stand up or sit down from their seats) to illustrate the meaning of ascending (to climb up) and descending (to climb down).

3. Jonya and Mikel are trying to determine the smallest angle in this figure. Jonya thinks that $\angle 5$ is the smallest. Mikel think that $\angle 1$ is the smallest. Who is correct? Explain your thinking. The figure is not drawn to scale.



A common misconception would be for students to conclude that $\angle 5$ is the smallest angle because it is across from the smallest side of the two triangles. This may indicate that some students do not realize that the angle-side relationships only valid within a single triangle. Teachers should highlight to students that the angle-side relationships can only be found in a triangle, and not necessarily within an entire composite figure, when first introducing the concept. For example, teachers may consider saying, "the relationships between angles and sides in a triangle" instead of "the relationships between angles and sides in triangles." Teachers may wish to have students identify the smallest angle in ΔABD and the smallest angle in ΔBCD first. Then, have a class discussion and ask students to create counterexamples to show why $\angle 5$ does not have to be the smallest angle of the two given triangles.

4. ΔPQR has a perimeter of 48 cm. $\overline{PQ} = x$, $\overline{QR} = \frac{4}{3}\overline{PR}$, and $\overline{PR} = \frac{3}{5}\overline{PQ}$. List the interior angle measures of ΔPQR, ordered from greatest to least.

A common error some students may make is to base their list of the angles in descending order according to the coefficients of the given side length measures, $\overline{QR}$ being the longest side and $\overline{PR}$ being the shortest side. This may indicate that some students are not considering that $\overline{QR} = \frac{4}{3}\overline{PR}$ is equivalent to $\frac{4}{3} \cdot \frac{3}{5}x$, which represents the side between the longest and shortest side of the triangle. Teachers should encourage students to draw out the triangle and label each side based on the given information before ordering the angles. Then, engage students in color-coding as described in previous teacher notes to help them to differentiate between the longest side lengths and the relationship to the angle measures.