Name: _____   Period: **1**   **2**   **3**   **4**   **5**   **6**   **7**
(circle appropriate period)

Directions: Show all work in the indicated spaces. In order to earn full marks, your work as well as your answer must be correct. Partial credit will be given for well-presented partially correct work. You may use a calculator, but you must show your work; circle your final answer.

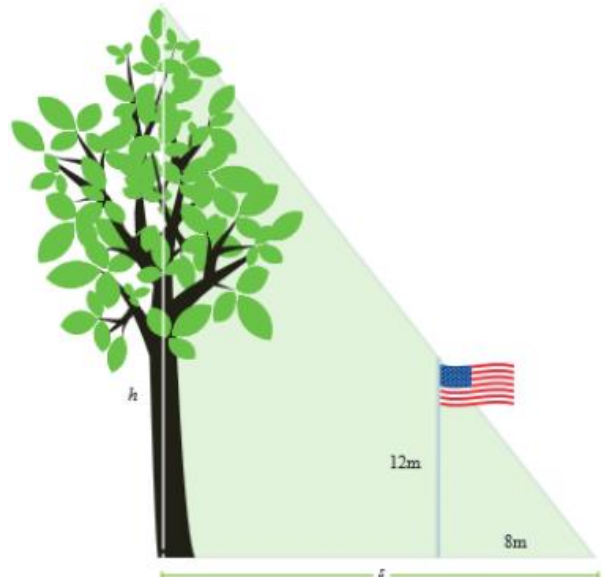## PAPERS COMPLETED IN PEN WILL NOT BE GRADED

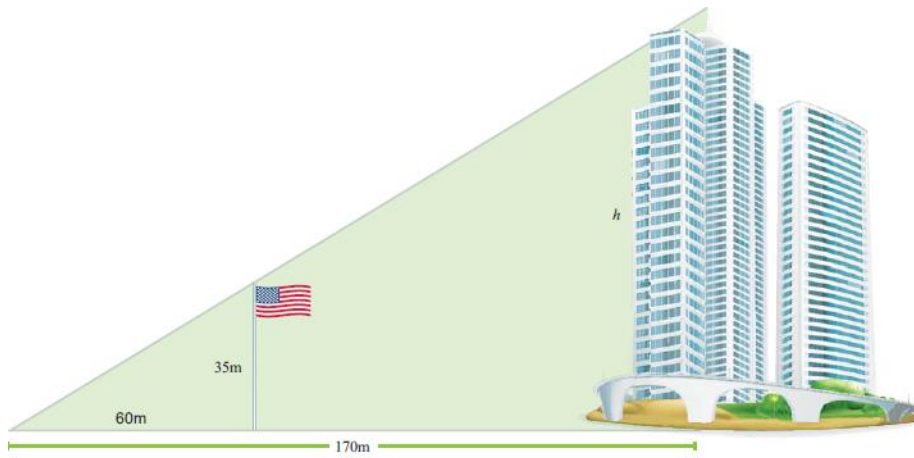**1.** Similarity = _____

Characteristics

2. Corresponding angles of similar triangles are _____.

3. Corresponding sides of similar triangles are _____.

Tasks

4. At a certain time of day, a 12 m flagpole casts an 8 m shadow. Write an equation that would allow you to find the height, h, of the tree that uses the length, s, of the tree's shadow.

35m
60m
170m

**5.** In the diagram above, a large flagpole stands outside of an office building. Marquis realizes that when he looks up from the ground 60 m away from the flagpole, the top of the flagpole and the top of the building line up. If the flagpole is 35 m tall and Marquis is 170 m from the building, how tall is the building?

    a.   Are the triangles in the diagram similar? Explain.

    b.   Determine the height of the building using what you know about scale factors.

    c.   Determine the height of the building using ratios *between* similar figures.

6. The following right triangles are similar. We will determine the unknown side lengths by using ratios within the first triangle. For each of the triangles below, we define the base as the horizontal length of the triangle and the height as the vertical length.

5 4
3
A
1.5
B 5
8
C
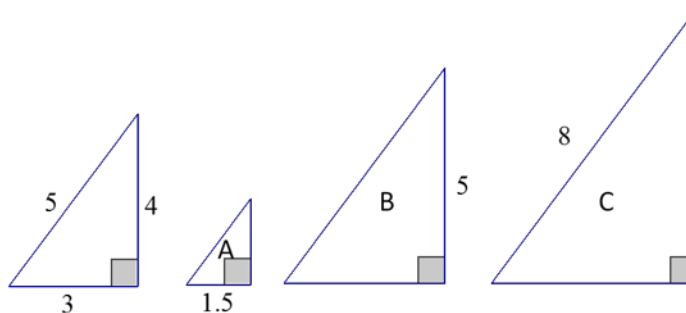
a.   Write and find the value of the ratio that compares the height to the hypotenuse of the leftmost triangle.

b.   Write and find the value of the ratio that compares the base to the hypotenuse of the leftmost triangle.

c.   Write and find the value of the ratio that compares the height to the base of the leftmost triangle.

Use the triangle with lengths $3-4-5$ and triangle C to answer the following questions:

   i.   Which ratio can be used to determine the height of triangle C?

   ii.   Which ratio can be used to determine the base of triangle C?

   iii. Find the unknown lengths of triangle C.

7. Brian is photographing the Washington Monument and wonders how tall the monument is. Brian places his 5 ft. camera tripod approximately 100 yd. from the base of the monument. Lying on the ground, he visually aligns the top of his tripod with the top of the monument and marks his location on the ground approximately 2 ft. 9 in. from the center of his tripod. Use Brian's measurements to approximate the height of the Washington Monument.