4-4 Geometric Mean

pages 303-310

Warm-Up

What are the next 3 terms in the geometric sequence:

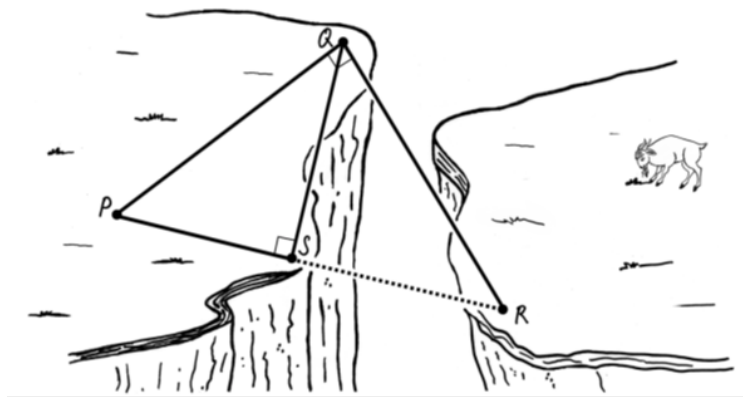2, 6, 18, 54, _____ , _____ , _____

Simplify the radicals:

$$\sqrt{9} \qquad\qquad \sqrt{27} \qquad\qquad 3\sqrt{18}$$

Bridge Over Canyon: p 304

A bridge is needed to cross over a canyon. The dotted line segment connecting points *S* and *R* represents the bridge. The distance from point *P* to point *S* is 45 yards. The distance from point *Q* to point *S* is 130 feet. How long is the bridge?

Cut out the three triangles and arrange the triangles so they have same orientation. Are any of the triangles similar to each other? If so, which triangles are similar? Justify your response.

---

p 306 #4,5

Complete the following similarity statements using your triangles:

$$\Delta PQR \sim \Delta _____ \sim \Delta _____$$

Write the corresponding sides of ΔPST & ΔUSR as proportions:

Write the corresponding sides of ΔPST & ΔPQR as proportions:

Write the corresponding sides of ΔUSR & ΔPQR as proportions:

Right Triangle Altitude Similarity Theorem:

The altitude to the hypotenuse of a right triangle forms two triangles _____ to the original right triangle.
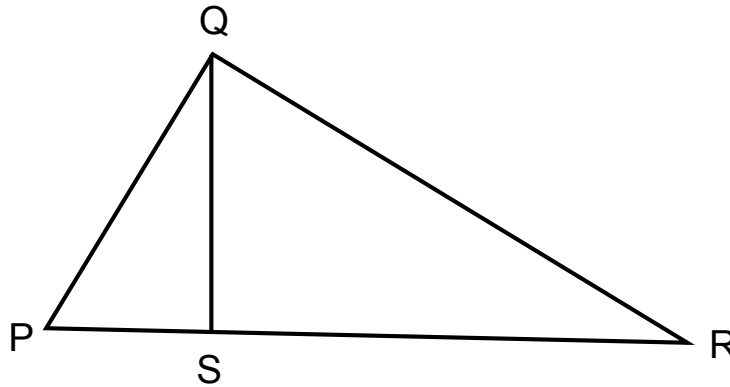
Geometric Mean: The geometric mean between two positive numbers *a* and b is the positive number *x* such that
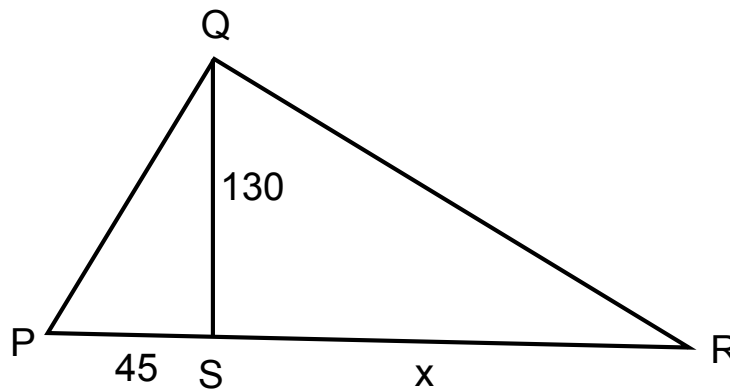
$$\frac{a}{x} = \frac{x}{b}$$

Are there any geometric means found in the proportions on the previous page?

Write the 3 geometric mean proportions that are created when the altitude is drawn to the hypotenuse of a right triangle.

Q

P

S

R

Find the length of the bridge needed to cross the canyon.

Q

130

P

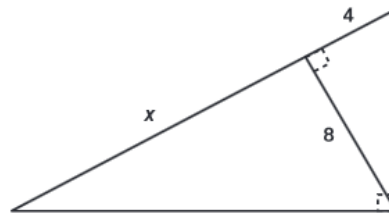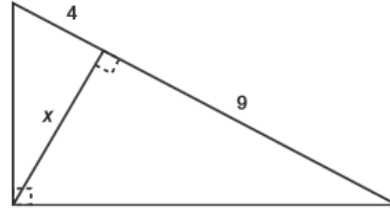45   S   x   R

Find the geometric mean between 20 and 5.

Find the geometric mean between 24 and 4.

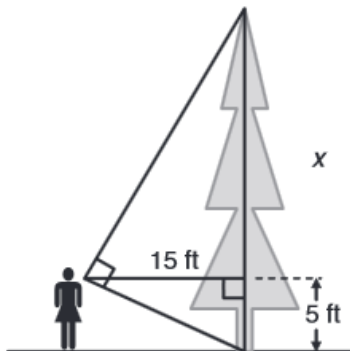The geometric mean between two numbers is 20. One of the numbers is 50, find the other number.
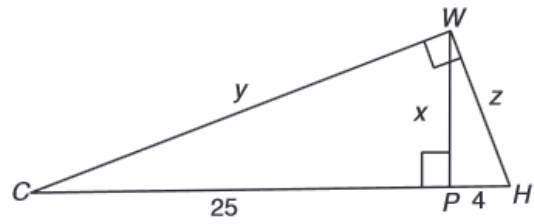
Solve for x:

You are standing 15 feet from a tree. Your line of sight to the top of the tree and to the bottom of the tree forms a 90-degree angle as shown in the diagram. The distance between your line of sight and the ground is 5 feet. Estimate the height of the tree.

Solve for x, y, and z.

Solve for x, y, and z.