MAFS.912.G-SRT.3.6

1. In this figure, triangle GHJ is similar to triangle PQR.

![Diagram of similar triangles GHJ and PQR]

Based on this information, which ratio represents \( \tan H \)?

A. \( \frac{8}{15} \)
B. \( \frac{8}{17} \)
C. \( \frac{15}{8} \)
D. \( \frac{17}{8} \)

2. Given the right triangle ABC.

![Diagram of right triangle ABC]

Select the ratio equivalent to \( \sin(B) \).

A. \( \frac{4}{5} \)
B. \( \frac{5}{3} \)
C. \( \frac{3}{5} \)
D. \( \frac{3}{4} \)

3. Use the dimensions given in the right triangle below.

![Diagram of right triangle with sides 15, 9, and 12]

What is the cosine of \( \angle A \)?

A. \( \frac{4}{5} \)
B. \( \frac{4}{3} \)
C. \( \frac{2}{5} \)
D. \( \frac{3}{4} \)

MAFS.912.G-SRT.3.7

1. If \( \cos(x + 30^\circ) = \sin x \), a measure of angle \( x \) is

A. 30
B. 60
C. 90
D. 120

2. In \( \triangle ABC \), the complement of \( \angle A \) is \( \angle B \). Which statement is always true?

A. \( \tan A = \tan B \)
B. \( \sin A = \tan B \)
C. \( \cos A = \tan B \)
D. \( \cos A = \sin B \)

3. If \( \sin 2A = \cos 3A \), then \( m\angle A \) is

A. 5
B. 15
C. 18
D. 36

MAFS.912.G-SRT.3.8

1. An archaeological team is excavating artifacts from a sunken merchant vessel on the ocean floor. To assist the team, a robotic probe is used remotely. The probe travels approximately 3,900 meters at an angle of depression of 67.4 degrees from the team’s ship on the ocean surface down to the sunken vessel on the ocean floor. The figure shows a representation of the team’s ship and the probe.

![Diagram of the team's ship and the probe on the ocean floor]
How many meters below the surface of the ocean will the probe be when it reaches the ocean floor? Give your answer to the nearest hundred meters.

2. A spring is attached at one end to support B and at the other end to collar A, as represented in the figure. Collar A slides along the vertical bar between points C and D. In the figure, the angle \( \theta \) is the angle created as the collar moves between points C and D.

### Part A
When \( \theta = 28^\circ \), what is the distance from point A to point B to the nearest tenth of a foot?

### Part B
When the spring is stretched and the distance from point A to point B is 5.2 feet, what is the value of \( \theta \) to the nearest tenth of a degree?

- A. 35.2°
- B. 45.1°
- C. 54.8°
- D. 60.0°

3. Mariela is standing in a building and looking out of a window at a tree. The tree is 20 feet away from Mariela. Mariela’s line of sight to the top of the tree creates a 42° angle of elevation, and her line of sight to the base of the tree creates a 31° angle of depression.

What is the height, in feet, of the tree?

### Mini Assessment # 8

1. Use the dimensions given in the diagram.

Which equation would be used to find the distance \( q \) from point A to point B?

- A. \( q = \frac{65}{\sin 57^\circ} \)
- B. \( q = \frac{65}{\tan 57^\circ} \)
- C. \( q = 65 \sin 57^\circ \)
- D. \( q = 65 \tan 57^\circ \)

2. Bob uses a 20 foot ladder to paint a section of his house that is 16 feet high.

Select all equations that can be used to solve for \( \theta \).

- \( \sin \theta = \frac{12}{20} \)
- \( \cos \theta = \frac{12}{20} \)
- \( \tan = \frac{12}{20} \)
- \( \sin \theta = \frac{16}{20} \)
- \( \cos \theta = \frac{16}{20} \)
- \( \tan = \frac{16}{20} \)

3. Donna wants to calculate the height of a tree. She makes the following measurements.

- The length of the tree’s shadow is 29 meters.
- The angle of elevation from the ground to the top of the tree is 30°.
Find the height of the tree, in meters. Round your answer to the nearest whole meter.

4. In right triangle DEF, the length of $\overline{DE}$ is 5 inches. The measure of $\angle EDF$ is 28°. Find the length of the hypotenuse of the triangle to the nearest tenth.

A. 4.4 inches  
B. 5.7 inches  
C. 9.4 inches  
D. 10.7 inches

5. Which expression is always equivalent to $\sin x$ when $0^\circ < x < 90^\circ$?  
A. $\cos(90^\circ - x)$  
B. $\cos(45^\circ - x)$  
C. $\cos(2x)$  
D. $\cos(x)$