

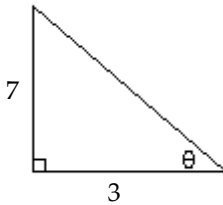
Name: Last \_\_\_\_\_ . First \_\_\_\_\_

**You must show your work and/or provide explanations for your answers for all questions. Otherwise, no credit will be given.**

**MULTIPLE CHOICE.** Choose the one alternative that best completes the statement or answers the question.

Find the value of the indicated trigonometric function of the angle  $\theta$  in the figure. Give an exact answer with a rational denominator.

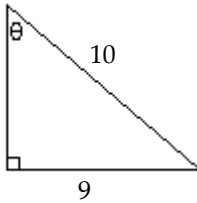
1) \_\_\_\_\_



Find  $\sin \theta$ .

- A)  $\sin \theta = \frac{\sqrt{58}}{7}$       B)  $\sin \theta = \frac{\sqrt{58}}{3}$       C)  $\sin \theta = \frac{7\sqrt{58}}{58}$       D)  $\sin \theta = \frac{3\sqrt{58}}{58}$

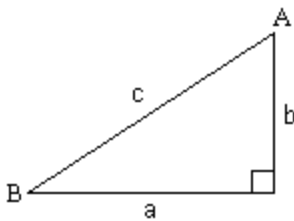
2) \_\_\_\_\_



Find  $\tan \theta$ .

- A)  $\frac{9}{10}$       B)  $\frac{9\sqrt{19}}{19}$       C)  $\frac{10\sqrt{19}}{19}$       D)  $\frac{\sqrt{19}}{10}$

Solve the right triangle using the information given. Round answers to two decimal places, if necessary.



3)  $b = 5, B = 25^\circ$ ; Find a, c, and A. \_\_\_\_\_

- A)  $a = 10.72$   
 $c = 11.83$   
 $A = 65^\circ$       B)  $a = 10.72$   
 $c = 12.83$   
 $A = 75^\circ$       C)  $a = 10.72$   
 $c = 11.83$   
 $A = 75^\circ$       D)  $a = 10.72$   
 $c = 12.83$   
 $A = 65^\circ$

4)  $b = 8$ ,  $A = 25^\circ$ ; Find  $a$ ,  $c$ , and  $B$ .

4) \_\_\_\_\_

A)  $a = 3.73$   
 $c = 9.83$   
 $B = 65^\circ$

B)  $a = 4.73$   
 $c = 9.83$   
 $B = 65^\circ$

C)  $a = 4.73$   
 $c = 8.83$   
 $B = 65^\circ$

D)  $a = 3.73$   
 $c = 8.83$   
 $B = 65^\circ$

**Solve the problem.**

5) A building 150 feet tall casts a 30 foot long shadow. If a person looks down from the top of the building, what is the measure of the angle between the end of the shadow and the vertical side of the building (to the nearest degree)? (Assume the person's eyes are level with the top of the building.)

5) \_\_\_\_\_

A)  $12^\circ$

B)  $11^\circ$

C)  $78^\circ$

D)  $79^\circ$

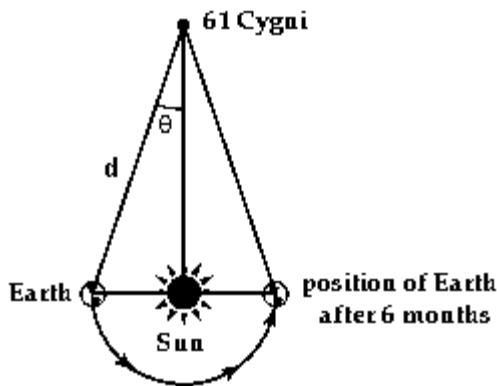
**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

6) In 1838, the German mathematician and astronomer Friedrich Wilhelm Bessel was the first person to calculate the distance to a star other than the Sun. He accomplished this by first determining the parallax of the star, 61 Cygni, at 0.314 arc seconds (Parallax is the change in position of the star measured against background stars as Earth orbits the Sun. See illustration.) If the distance from Earth to the Sun is about 150,000,000 km and

6) \_\_\_\_\_

$$\theta = 0.314 \text{ seconds} = \frac{0.314}{60} \text{ minutes} = \frac{0.314}{60 \cdot 60} \text{ degrees}$$

determine the distance  $d$  from Earth to 61 Cygni using Bessel's figures.



**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

7) A sailboat leaves port on a bearing of  $S72^\circ W$ . After sailing for two hours at 12 knots, the boat turns  $90^\circ$  toward the south. After sailing for three hours at 9 knots on this course, what is the bearing to the ship from port? Round your answer to the nearest  $0.1^\circ$ .

7) \_\_\_\_\_

A)  $S23.6^\circ W$

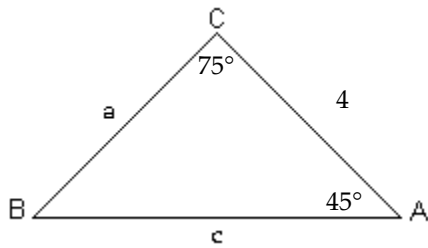
B)  $N23.6^\circ E$

C)  $S24.6^\circ W$

D)  $N24.6^\circ E$

Solve the triangle.

8)



8) \_\_\_\_\_

A)  $B = 60^\circ, a = 4.46, c = 3.27$

B)  $B = 55^\circ, a = 4.46, c = 3.27$

C)  $B = 65^\circ, a = 3.27, c = 4.46$

D)  $B = 60^\circ, a = 3.27, c = 4.46$

9)  $B = 40^\circ, C = 80^\circ, a = 4$

9) \_\_\_\_\_

A)  $A = 60^\circ, b = 5.55, c = 2.97$

B)  $A = 60^\circ, b = 3.97, c = 4.55$

C)  $A = 60^\circ, b = 2.97, c = 4.55$

D)  $A = 60^\circ, b = 4.55, c = 2.97$

Two sides and an angle are given. Determine whether the given information results in one triangle, two triangles, or no triangle at all. Solve any triangle(s) that results.

10)  $a = 7, b = 9, B = 49^\circ$

10) \_\_\_\_\_

A) one triangle

B) one triangle

$A = 76.01^\circ, C = 54.99^\circ, c = 7.60$

$A = 35.94^\circ, C = 95.06^\circ, c = 11.88$

C) two triangles

D) no triangle

$A_1 = 76.01^\circ, C_1 = 54.99^\circ, c_1 = 7.60$  or

$A_2 = 103.99^\circ, C_2 = 27.01^\circ, c_2 = 12.14$

11)  $b = 4, c = 8, B = 80^\circ$

11) \_\_\_\_\_

A) one triangle

B) one triangle

$B = 40^\circ, A = 60^\circ, a = 12$

$C = 41^\circ, A = 59^\circ, a = 16$

C) one triangle

D) no triangle

$C = 39^\circ, A = 61^\circ, a = 14$

12)  $a = 10, b = 5, B = 15^\circ$

12) \_\_\_\_\_

A) one triangle

B) one triangle

$A = 31.17^\circ, C = 133.83^\circ, c = 13.94$

$A = 148.83^\circ, C = 16.17^\circ, c = 5.38$

C) two triangles

D) no triangle

$A_1 = 31.17^\circ, C_1 = 133.83^\circ, c_1 = 13.94$  or

$A_2 = 148.83^\circ, C_2 = 16.17^\circ, c_2 = 5.38$

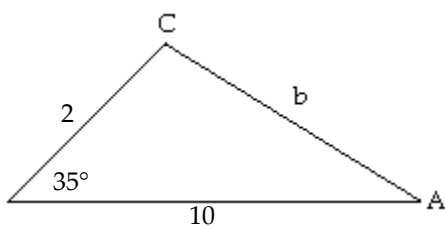
**Solve the problem.**

- 13) A rocket tracking station has two telescopes A and B placed 1.1 miles apart. The telescopes lock onto a rocket and transmit their angles of elevation to a computer after a rocket launch. What is the distance to the rocket from telescope B at the moment when both tracking stations are directly east of the rocket telescope A reports an angle of elevation of  $26^\circ$  and telescope B reports an angle of elevation of  $48^\circ$ ? 13) \_\_\_\_\_
- A) 2.18 mi                      B) 1.86 mi                      C) 0.65 mi                      D) 1.29 mi

- 14) To find the distance AB across a river, a distance BC of 1353 m is laid off on one side of the river. It is found that  $B = 112.9^\circ$  and  $C = 13.2^\circ$ . Find AB. Round to the nearest meter. 14) \_\_\_\_\_
- A) 313 m                      B) 310 m                      C) 382 m                      D) 385 m

**Solve the triangle.**

- 15) 15) \_\_\_\_\_

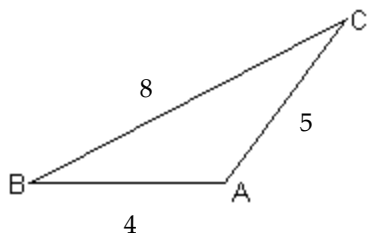


- A)  $b = 7.44, A = 137.2^\circ, C = 7.8^\circ$                       B)  $b = 9.44, A = 7.8^\circ, C = 137.2^\circ$   
 C)  $b = 8.44, A = 7.8^\circ, C = 137.2^\circ$                       D)  $b = 8.44, A = 137.2^\circ, C = 7.8^\circ$

- 16)  $a = 70, b = 12, C = 105^\circ$  16) \_\_\_\_\_

- A)  $c = 74.02, A = 66^\circ, B = 9^\circ$                       B)  $c = 79.82, A = 64^\circ, B = 11^\circ$   
 C)  $c = 76.92, A = 68^\circ, B = 7^\circ$                       D) no triangle

- 17) 17) \_\_\_\_\_



- A)  $A = 125.1^\circ, B = 24.1^\circ, C = 30.8^\circ$                       B)  $A = 30.8^\circ, B = 125.1^\circ, C = 24.1^\circ$   
 C)  $A = 125.1^\circ, B = 30.8^\circ, C = 24.1^\circ$                       D)  $A = 30.8^\circ, B = 24.1^\circ, C = 125.1^\circ$

- 18)  $a = 9, b = 13, c = 16$  18) \_\_\_\_\_

- A)  $A = 34.2^\circ, B = 54.3^\circ, C = 91.5^\circ$                       B)  $A = 32.2^\circ, B = 54.3^\circ, C = 93.5^\circ$   
 C)  $A = 36.2^\circ, B = 52.3^\circ, C = 91.5^\circ$                       D) no triangle



- 24) Find the area of the Bermuda Triangle if the sides of the triangle have the approximate lengths 849 miles, 927 miles, and 1320 miles. 24) \_\_\_\_\_
- A) 391,415 mi                      B) 517,257 mi                      C) 496,233 mi                      D) 1,565,659 mi

## Answer Key

Testname: MATH1113-Q4-PRACTICE-SUMMER 2008

- 1) C
- 2) B
- 3) A
- 4) D
- 5) B
- 6)  $9.85 \times 10^{13}$  km (More recent observations have refined this value to about  $1.08 \times 10^{14}$  km.)
- 7) A
- 8) D
- 9) C
- 10) B
- 11) D
- 12) C
- 13) D
- 14) C
- 15) C
- 16) A
- 17) C
- 18) A
- 19) B
- 20) D
- 21) A
- 22) 344 sq. cm
- 23) C
- 24) A