Student: _____ Date: _____	**Instructor:** Robert Brown **Course:** Math 1113 Spring 2018 Dr. Bob Brown, Jr.	**Assignment:** Pre-Calculus Test 4 Review

1. Select the correct choice that completes the sentence below.

   Given two sides of a triangle, b and c, and the included angle A, the altitude h from angle B to side b is given by

   (1) _____

   (1) ○ b **sin** A.

   ○ $\frac{1}{2}$ bc **sin** A.

   ○ c **sin** A.

   ○ $\frac{1}{2}$ ab **sin** A.

   ID: 9.4.5

2. Decide whether the following statement is true or false.

   In a right triangle, if two acute angles are known, then the triangle can be solved.

   Choose the correct answer below.

   ○ **A.** True, because the missing side can be found using the Pythagorean Theorem and all the angles can be found using trigonometric functions.

   ○ **B.** False, because solving a right triangle requires knowing one of the acute angles A or B and a side, or else two sides.

   ○ **C.** False, because the missing side can be found using the Pythagorean Theorem, but the angles cannot be found.

   ○ **D.** True, because the missing side can be found using the complementary angle theorem.

   ID: 9.1.8

3. In a right triangle, if the length of the hypotenuse is 10 and the length of one of the other sides is 6, what is the length of the third side?

   _____ (Simplify your answer.)

   ID: 9.1.1

4. If θ is an acute angle, solve the equation **tan** $\theta = \frac{2}{5}$. Express your answer in degrees, rounded to one decimal place.

   Select the correct choice below, and, if necessary, fill in the answer box to complete your choice.

   ○ **A.** θ = _____ °
   (Round to one decimal place as needed. Use a comma to separate answers as needed.)

   ○ **B.** There is no solution.

   ID: 9.1.3

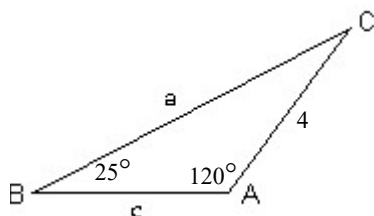5. Solve the right triangle using the information given. Round answers to two decimal places, if necessary.
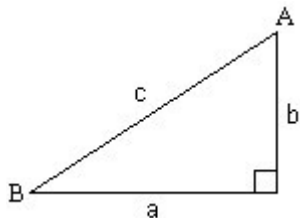
a = 7, b = 3; Find c, A, and B.

- **A.** c = 7.62
  A = 67.80°
  B = 22.20°

- **B.** c = 6.32
  A = 66.80°
  B = 23.20°

- **C.** c = 6.32
  A = 67.80°
  B = 22.20°

- **D.** c = 7.62
  A = 66.80°
  B = 23.20°

ID: 9.1-3

6. Solve the triangle.

- **A.** C = 35°, a = 8.19, c = 5.43
- **B.** C = 30°, a = 5.43, c = 8.19
- **C.** C = 35°, a = 5.43, c = 8.19
- **D.** C = 40°, a = 8.19, c = 5.43

ID: 9.2-2

7.

A cruise ship maintains a speed of 10 knots (nautical miles per hour) sailing from San Juan to Barbados, a distance of 600 nautical miles. To avoid a tropical storm, the captain heads out of San Juan at a direction of 34° off a direct heading to Barbados. The captain maintains the 10-knot speed for 12 hours, after which time the path to Barbados becomes clear of storms.
(a) Through what angle should the captain turn to head directly to Barbados?
(b) Once the turn is made, how long will it be before the ship reaches Barbados if the same 10-knot speed is maintained?
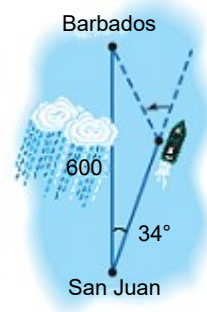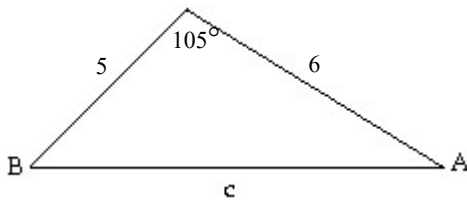

(a) The captain should head through an angle of _____°.
(Do not round until the final answer. Then round to one decimal place as needed.)

(b) The time it will take for the ship to reach Barbados is _____ hours.
(Do not round until the final answer. Then round to one decimal place as needed.)
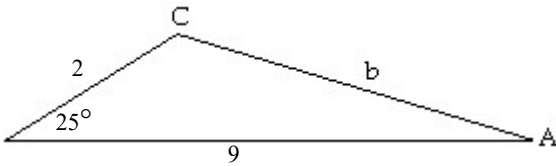
ID: 9.3.45

8. Solve the triangle. Round your answer to two decimal places as needed.

- **A.** c = 7.75, A = 41.49°, B = 33.51°
- **B.** c = 8.75, A = 41.49°, B = 33.51°
- **C.** c = 8.75, A = 33.51°, B = 41.49°
- **D.** c = 9.75, A = 33.51°, B = 41.49°
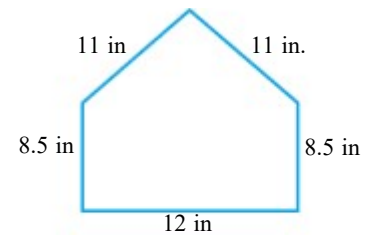
ID: 9.3-2

9. Find the area of the triangle. If necessary, round the answer to two decimal places.

- **A.** 15.21
- **B.** 8.16
- **C.** 3.80
- **D.** 7.61

ID: 9.4-2

10. The dimensions of home plate at a random baseball field in the United States are shown. Find the area of home plate.

The area of home plate is approximately _____ square inches.
(Round to two decimal places as needed.)

ID: 9.4.39

11. Find the area of the segment (shaded in blue in the figure) of a circle whose radius is 6 feet, formed by a central angle of 50°.
    [Hint: Subtract the area of the triangle from the area of the sector to obtain the area of the segment.]
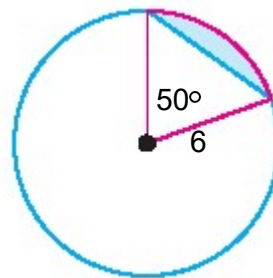
The area of the segment is approximately _____ square feet.
(Do not round until the final answer. Then round to two decimal places as needed.)

ID: 9.4.35

---

12. A triangular building is bounded by three streets. The building measures approximately 94 feet on the first street, 192 feet on the second street, and 176 feet on the third street. Approximate the ground area K covered by the building.

$K \approx$ _____ square feet
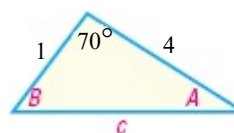(Round to two decimal places as needed.)

ID: 9.4.43

---

13. Find the area K of the triangle.

$b = 2, c = 3, A = 70°$

$K =$ _____ square units
(Do not round until the final answer. Then round to two decimal places as needed.)

ID: 9.4.17

---

14. Find the area K of the triangle.

$K =$ _____ square units
(Round to two decimal places as needed.)

ID: 9.4.9

---

15. Solve the triangle.

$a = 5, b = 3, c = 4$

$A \approx$ _____ ° (Round to one decimal place as needed.)

$B \approx$ _____ ° (Round to one decimal place as needed.)

$C \approx$ _____ ° (Round to one decimal place as needed.)

ID: 9.3.25

---

16. Two hikers on opposite sides of a canyon each stand precisely 525 meters above the canyon floor. They each sight a landmark on the canyon floor on a line directly between them. The angles of depression from each hiker to the landmark meter are 37° and 21°. How far apart are the hikers? Round your answer to the nearest whole meter.

- A. 1064 m
- B. 2064 m
- C. 2063 m
- D. 2065 m

ID: 9.1-10

17. Solve the triangle. Round your answer to the nearest tenth as needed.

$a = 15$, $b = 15$, $c = 13$

- A. $A = 51.4°$, $B = 64.3°$, $C = 64.3°$
- B. $A = 65.3°$, $B = 65.3°$, $C = 49.4°$
- C. $A = 64.3°$, $B = 51.4°$, $C = 64.3°$
- D. $A = 64.3°$, $B = 64.3°$, $C = 51.4°$

ID: 9.3-9

18. Consult the figure. To find the length of the span of a proposed ski lift from A to B, a surveyor measures the angle DAB to be 25° and then walks off a distance of L = 1600 feet to C and measures the angle ACB to be 15°. What is the distance from A to B?
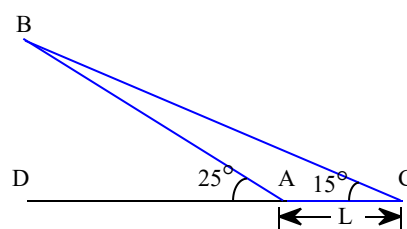
The distance from A to B is approximately _____ feet.
(Do not round until the final answer. Then round to two decimal places as needed.)

ID: 9.2.37

19. 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. Round your answers to two decimal places.

$a = 7$, $b = 9$, $B = 49°$

- A. one triangle
  $A = 35.94°$, $C = 95.06°$, $c = 11.88$
- B. two triangles
  $A_1 = 76.01°$, $C_1 = 54.99°$, $c_1 = 7.60$ or
  $A_2 = 103.99°$, $C_2 = 27.01$, $c_2 = 12.14$
- C. one triangle
  $A = 76.01°$, $C = 54.99°$, $c = 7.60$
- D. no triangle

ID: 9.2-4

20. 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.

    $a = 4$, $b = 2$, $B = 15°$

    ○ **A.** one triangle
      $A = 31.17°$, $C = 133.83°$, $c = 5.57$
    ○ **B.** one triangle
      $A = 148.83°$, $C = 16.17°$, $c = 2.15$
    ○ **C.** two triangles
      $A_1 = 31.17°$, $C_1 = 133.83°$, $c_1 = 5.57$ or
      $A_2 = 148.83°$, $C_2 = 16.17°$, $c_2 = 2.15$
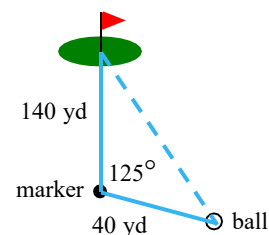   ○ **D.** no triangle

    ID: 9.2-6

21. 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.

    $B = 108°$, $b = 5$, $a = 23$

    ○ **A.** one triangle
      $A = 53°$, $C = 18°$, $c = 30$
    ○ **B.** one triangle
      $A = 54°$, $C = 18°$, $c = 28$
    ○ **C.** one triangle
      $A = 55°$, $C = 18°$, $c = 32$
    ○ **D.** no triangle

    ID: 9.2-7

22. A golfer hits an errant tee shot that lands in the rough. A marker in the center of the fairway is 140 yards from the center of the green. While standing on the marker and facing the green, the golfer turns $125°$ towards his ball. He then paces off 40 yards to his ball. How far is the ball from the center of the green?

    The ball is about _____ yards from the center of the green.
    (Round to one decimal place as needed.)

    ID: 9.3.43

1. (1) c **sin** A.

2. B. False, because solving a right triangle requires knowing one of the acute angles A or B and a side, or else two sides.

3. 8

4. A. θ = ___**21.8**___ °(Round to one decimal place as needed. Use a comma to separate answers as needed.)

5. D. c = 7.62 A = 66.80° B = 23.20°

6. A. C = 35°, a = 8.19, c = 5.43

7. 41.6

 50.5

8. C. c = 8.75, A = 33.51°, B = 41.49°

9. C. 3.80

10. 157.32

11. 1.92

12. 8239.10

13. 2.82

14. 1.88

15. 90.0

 36.9

 53.1

16. B. 2064 m

17. D. A = 64.3°, B = 64.3°, C = 51.4°

18. 2384.77

---

19. A. one triangle $A = 35.94°$, $C = 95.06°$, $c = 11.88$

---

20. C. two triangles $A_1 = 31.17°$, $C_1 = 133.83°$, $c_1 = 5.57$ or $A_2 = 148.83°$, $C_2 = 16.17°$, $c_2 = 2.15$

---

21. D. no triangle

---

22. 166.2