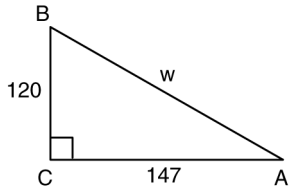
CHAPTER 2, FORM A
TRIGONOMETRY

NAME _____
DATE _____

For Problems 1-10, do not use a calculator.

1. Write sin 29° 32′ in terms of its cofunction. **1.** _____

2. Find cos *A*, sec *A*, and cot *A* for the figure below. **2.** cos *A*: _____
sec A: _____
cot A: _____



Solve each equation. Assume that all angles are acute angles.

3. $\sec(18z) = \csc(6z)$ **3.** _____

4. $\sin(3d + 11°) = \cos(6d - 12°)$ **4.** _____

5. Which of the following has the same absolute value as cot 315° 13′ ? **5.** _____

a. cot 115° 13′ **b.** cot 44° 47′
c. cot 45° 13′ **d.** None of these

Evaluate each expression. Give exact values. Rationalize denominators when applicable.

6. cot 120° **6.** _____

7. $3\sin^2 210° + \tan 150°$ **7.** _____

8. $4(\csc 60°)(\sin 300°) - \tan^2 240°$ **8.** _____

Answer *true* or *false* for each statement.

9. tan 41° < tan 26° **9.** _____

10. sin 240° = 2 sin 30° cos 120° **10.** _____

A calculator may be used for Problems 11-20.

Find a decimal approximation for each.

11. cos 109° 52′ **11.** _____

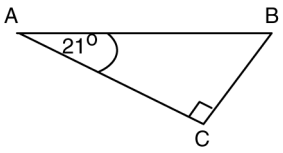
12. csc 73.56° **12.** _____

Find an angle θ in the interval [0°, 90°) that satisfies each statement. Give answers to the nearest tenth of a degree.

13. $\cos\theta = .8910$ **13.** _____

14. sin θ = .1200593 **14.** _____

Solve each of the following right triangles. The right angle is at C.

15. 

15. _____

16. $b = 610$, $c = 750$ **16.** _____

17. $A = 42°$, $a = 49.2$ **17.** _____

18. An observer is located at the origin of a coordinate system. Find the bearing of an object located at the point (–3, 3). **18.** _____

19. From a point 250 ft from the base of a tower, the angle of elevation to the top of the tower is 18.5°. How tall is the tower? **19.** _____

20. From a point 5.0 miles due north of a radio antenna, a hiker walks 2.0 mi west. The antenna is now S 21.8° E of the hiker. How far is the hiker from the antenna now? **20.** _____

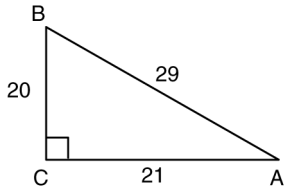
CHAPTER 2, FORM B
TRIGONOMETRY

NAME _____
DATE _____

For Problems 1-10, do not use a calculator.

1. Write sec 29° 51′ in terms of its cofunction. **1.** _____

2. Find csc *A*, sec *A*, and cot *A* for the figure below. **2.** csc *A*:_____
sec *A*:_____
cot *A*:_____



Solve each equation. Assume that all angles are acute angles.

3. $\tan(8b) = \cot(10b)$ **3.** _____

4. $\tan(3B + 10°) = \cot(B + 9°)$ **4.** _____

5. Which of the following has the same absolute value as tan 464° 19′ ? **5.** _____

a. tan 75° 41′ **b.** tan 64° 19′
c. tan 14° 19′ **d.** None of these

Evaluate each expression. Give exact values. Rationalize denominators when applicable.

6. tan 300° **6.** _____

7. $\sec^2 60° + 3\cos 210°$ **7.** _____

8. $\sec^2 390° + 2(\tan 60°)(\cos 150°)$ **8.** _____

Answer *true* or *false* for each statement.

9. tan 45° < tan 60° **9.** _____

10. cot 60° = 2 cot 30° **10.** _____

A calculator may be used for Problems 11-20.

Find a decimal approximation for each.

11. tan 92° 17′ **11.** _____

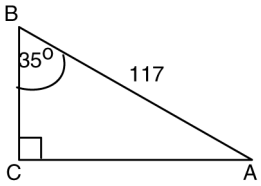
12. csc 116.52° **12.** _____

Find an angle θ in the interval [0°, 90°) that satisfies each statement. Give answers to the nearest tenth of a degree.

13. sin θ = .4848 **13.** _____

14. cot θ = 5.937006 **14.** _____

Solve each of the following right triangles. The right angle is at *C*.

15. 

15. _____

16. $a = 42$, $b = 39.8$ **16.** _____

17. $A = 55°$, $a = 24$ **17.** _____

18. An observer is located at the origin of a coordinate system. Find the bearing of an object located at the point (4, – 4). **18.** _____

19. From the top of a 150-foot-tall lighthouse, a boat is spotted with an angle of depression of 18.4°. How far is the boat from the base of the lighthouse? **19.** _____

20. The bearing from *A* to *C* is 36°. The bearing from *C* to *B* is 126°. The bearing from *A* to *B* is 76°. If the distance from *A* to *C* is 53 miles, what is the distance from *C* to *B*? **20.** _____

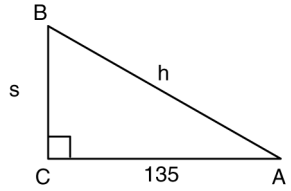
CHAPTER 2, FORM C
TRIGONOMETRY

NAME _____
DATE _____

For problems 1-10, do not use a calculator.

1. Write sin 89° in terms of its cofunction. **1.** _____

2. Find sin A, cos A, and tan A for the figure below. **2.** sin A: _____
cos A: _____
tan A: _____



Solve each equation. Assume that all angles are acute angles.

3. $\sin(12\theta) = \cos(7\theta)$ **3.** _____

4. $\tan(160\beta + 9°) = \cot(4\beta - 11°)$ **4.** _____

5. Which of the following has the same absolute value as sec 198° 21′ ? **5.** _____

a. sec 18° 21′ **b.** sec 1° 39′
c. sec 98° 21′ **d.** None of these

Evaluate each expression. Give exact values. Rationalize denominators when applicable.

6. tan 225° **6.** _____

7. $\sin^2 60° + 2\sec 240°$ **7.** _____

8. $\tan^2 60° + 5(\sin 210°)(\tan 45°)$ **8.** _ _____

Answer *true* or *false* for each statement.

9. cos 49° > cos 12° **9.** _____

10. 2(sin 45°)(cos 45°) = sin 90° **10.** _____

A calculator may be used for Problems 11-20.

Find a decimal approximation for each.

11. cos 109° 52′ **11.** _____

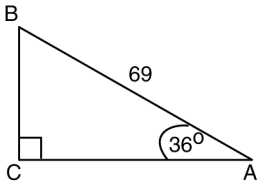
12. csc 73.56° **12.** _____

Find an angle θ in the interval [0°, 90°) that satisfies each statement.
Give answers to the nearest tenth of a degree.

13. $\sin \theta = 0.90015493$ **13.** _____

14. $\cot \theta = 7.2309185$ **14.** _____

Solve each of the following right triangles. The right angle is at C.

15. 

15. _____

16. $a = 42.3$, $b = 87$ **16.** _____

17. $B = 54°$, $c = 75$ **17.** _____

18. An observer is located at the origin of a coordinate system. Find the bearing of an object located at the point (–3, 3). **18.** _____

19. A laser gun is located 3000 ft from the base of a wall. The beam makes an angle of 1/2° with the horizon. How far up will the laser ray hit the wall? **19.** _____

20. A ship travels 14 miles on a bearing of 21°, and then it travels on a bearing of 111° for 20 miles. How far is it from its starting point? **20.** _____

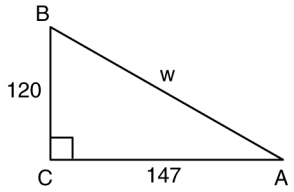
CHAPTER 2, FORM D
TRIGONOMETRY

NAME _____
DATE _____

For Problems 1-10, do not use a calculator.

1. Write csc 62° 15′ in terms of its cofunction. **1.** _____

2. Find csc *A*, sec *A*, and cot *A* for the figure below. **2.** cos *A*: _____
sec A: _____
cot A: _____



Solve each equation. Assume that all angles are acute angles.

3. $\sec(18z) = \csc(6z)$ **3.** _____

4. $\sin(3w + 4°) = \cos(6w - 8°)$ **4.** _____

5. Which of the following has the same absolute value as cot 315° 13′ ? **5.** _____

a. cot 115° 13′ **b.** cot 44° 47′
c. cot 45° 13′ **d.** None of these

Evaluate each expression. Give exact values. Rationalize denominators when applicable.

6. sec 60° **6.** _____

7. $3\sin^2 210° + \tan 150°$ **7.** _____

8. $4(\csc 60°)(\sin 300°) - \tan^2 240°$ **8.** _____

Answer *true* or *false* for each statement.

9. sin 80° < sin 50° **9.** _____

10. cot 30° + cot 60° = cot 90° **10.** _____

A calculator may be used for Problems 11-20.

Find a decimal approximation for each.

11. sin 463° 19′ **11.** _____

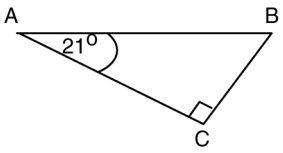
12. sec 68.31° **12.** _____

Find an angle θ in the interval [0°, 90°) that satisfies each statement. Give answers to the nearest tenth of a degree.

13. $\cos\theta = 0.61011032$ **13.** _____

14. $\sec\theta = 12.12003458$ **14.** _____

Solve each of the following right triangles. The right angle is at C.

15. 

15. _____

16. $b = 610$, $c = 750$ **16.** _____

17. $A = 42°$, $a = 49.2$ **17.** _____

18. An observer is located at the origin of a coordinate system. Find the bearing of an object located at the point (–5, 0). **18.** _____

19. From a point 250 ft from the base of a tower, the angle of elevation to the top of the tower is 18.5°. How tall is the tower? **19.** _____

20. From a point 5.0 miles due north of a radio antenna, a hiker walks 2.0 mi west. The antenna is now S 21.8° E of the hiker. How far is the hiker from the antenna now? **20.** _____

CHAPTER 2, FORM E NAME _____
TRIGONOMETRY DATE _____

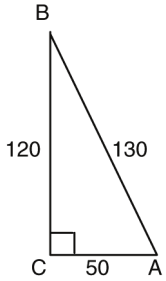
Choose the best answer.

For Problems 1-10, do not use a calculator.

1. What is the cofunction of sin 21° 19′ ? **1.** _____

a. sin 111° 19′ **b.** cos 68° 41′
c. sin 68° 41′ **d.** cos 111° 19′

2. Find sin A, cos A, and tan A for the figure below. **2.** _____



a. $\sin A = \frac{12}{13}, \cos A = \frac{5}{13}, \tan A = \frac{12}{13}$

b. $\sin A = \frac{5}{13}, \cos A = \frac{12}{13}, \tan A = \frac{12}{13}$

c. $\sin A = \frac{12}{13}, \cos A = \frac{5}{13}, \tan A = \frac{12}{5}$

d. $\sin A = \frac{12}{13}, \cos A = \frac{5}{13}, \tan A = \frac{5}{12}$

Solve each equation. Assume that all angles are acute angles.

3. $\sin(3\alpha) = \cos(6\alpha)$ **3.** _____

a. $\alpha = 5°$ **b.** $\alpha = 9°$
c. $\alpha = 10°$ **d.** $\alpha = 20°$

4. $\tan(\beta + 10°) = \cot(2\beta - 10°)$ **4.** _____

a. $\beta = 15°$ **b.** $\beta = 30°$
c. $\beta = 45°$ **d.** $\beta = 50°$

5. Which of the following has the same absolute value as sin 195° 29′ ? **5.** _____

a. sin 95° 29′ **b.** sin 85° 31′
c. sin 25° 31′ **d.** None of these

Evaluate each expression. Give exact values. Rationalize denominators when applicable.

6. $\sin 420°$ **6.** _____

a. $\frac{1}{2}$ **b.** $-\frac{\sqrt{3}}{2}$

c. 2 **d.** $\frac{\sqrt{3}}{2}$

7. $\sin^2 135° + 3\cos 120°$ **7.** _____

a. $\frac{\sqrt{2}-3}{2}$ **b.** –1

c. $\frac{\sqrt{2}-1}{2}$ **d.** $-\frac{3}{2}$

8. $2(\csc 210°)(\tan 45°) + \sec^2 315°$ **8.** _____

a. –2 **b.** $\frac{6-4\sqrt{3}}{3}$

c. $-4+\sqrt{2}$ **d.** $\frac{-4\sqrt{3}-3\sqrt{2}}{3}$

9. Determine which of the following is not true. **9.** _____

a. $\sin 37° < \sin 56°$ **b.** $\cos 36° < \cos 35°$

c. $\sin 45° < \sin 42°$ **d.** $\tan 10° < \tan 80°$

10. Determine which of the following is true. **10.** _____

a. $\cos 45° + \cos 45° = \cos 90°$

b. $\cos 30° + \sin 60° = \tan 90°$

c. $\sin 45° + \sin 60° = \frac{\sqrt{5}}{2}$

d. $\sin 30° + \cos 60° = \tan 45°$

A calculator may be used for Problems 11-20.

Find a decimal approximation for each.

11. $\cos 425° 32'$ **11.** _____

a. .3928 **b.** .4142

c. –.4142 **d.** .4175

12. $\sec 95.29°$ **12.** _____

a. –10.846 **b.** –.0922

c. .9957 **d.** 1.004

Find an angle in the interval [0°, 90°) that satisfies each statement.
Give answers to the nearest tenth of a degree.

13. $\sin \beta = 0.213459$ **13.** _____

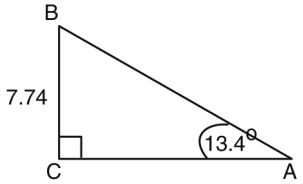
a. 37.3° **b.** 0.2°
c. 12.3° **d.** 87.7°

14. $\tan \beta = 12.34285$ **14.** _____

a. 14.6° **b.** 21.9°
c. 24.9° **d.** 85.4°

Solve each of the following right triangles. The right angle is at *C*.

15. **15.** _____



a. $b = 32.5$, $c = 33.4$, $B = 76.6°$
b. $b = 7.1$, $c = 10.5$, $B = 76.6°$
c. $b = 8.1$, $c = 11.2$, $B = 46.3°$
d. $b = 29.6$, $c = 30.6$, $B = 75.3°$

16. $a = 12.3$, $b = 19.2$ **16.** _____

a. $c = 31.5$, $A = 23.0°$, $B = 67.0°$
b. $c = 14.7$, $A = 50.2°$, $B = 39.8°$
c. $c = 22.8$, $A = 32.6°$, $B = 57.4°$
d. $c = 22.8$, $A = 52.3°$, $B = 37.7°$

17. $A = 42°$, $b = 9.1$ **17.** _____

a. $a = 10.1$, $c = 13.6$, $B = 48°$
b. $a = 6.3$, $c = 15.4$, $B = 36°$
c. $a = 8.2$, $c = 12.2$, $B = 48°$
d. $a = 12.2$, $c = 8.2$, $B = 58°$

18. The observer deck of a ship is located at the origin of a coordinate system. Find the bearing of an object located at the point (–5, 5). **18.** _____

a. 45° **b.** 135°
c. 225° **d.** 315°

19. A radio technician is at a spot that has an angle of elevation of 18.5° to the top of the 255-foot-tall transmitting antenna. How far is the radio technician from the base of the transmitting antenna? **19.** _____

a. 269 ft **b.** 762 ft
c. 804 ft **d.** 925 ft

20. The bearing from A to C is N 50° E. The bearing from C to B is S 40° E. The bearing from B to A is S 60° W. If the distance from A to C is 45 miles what is the distance from C to B?

a. 6 mi **b.** 8 mi
c. 12 mi **d.** 20 mi

20. _____

CHAPTER 2, FORM F NAME _____
TRIGONOMETRY DATE _____

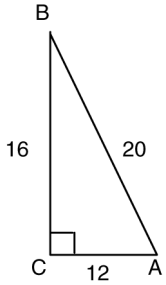
Choose the best answer.

For Problems 1-10, do not use a calculator.

1. What is the cofunction of sec 35° 26′ ? **1.** _____

a. csc 65° 26′ **b.** cos 125° 26′
c. cos 54° 34′ **d.** csc 54° 34′

2. Find sin *B*, cos *B*, and tan *B* for the figure below. **2.** _____



a. $\sin B = \frac{3}{5}, \cos B = \frac{4}{5}, \tan B = \frac{3}{4}$ **b.** $\sin B = \frac{4}{5}, \cos B = \frac{3}{5}, \tan B = \frac{3}{4}$

c. $\sin B = \frac{4}{5}, \cos B = \frac{3}{5}, \tan B = \frac{4}{5}$ **d.** $\sin B = \frac{5}{3}, \cos B = \frac{4}{3}, \tan B = \frac{4}{3}$

Solve each equation. Assume that all angles are acute angles.

3. $\csc(\beta) = \sec(3\beta)$ **3.** _____

a. $\beta = 15°$ **b.** $\beta = 22.5°$
c. $\beta = 45°$ **d.** $\beta = 60°$

4. $\cos(\theta + 15°) = \sin(2\theta + 30°)$ **4.** _____

a. $\theta = 12°$ **b.** $\theta = 15°$
c. $\theta = 30°$ **d.** $\theta = 45°$

5. Which of the following has the same absolute value as csc 212° 43′ ? **5.** _____

a. csc 12° 17′ **b.** csc 122° 43′
c. csc 147° 17′ **d.** None of these

Evaluate each expression. Give exact values. Rationalize denominators when applicable.

6. sec 690° **6.** _____

a. $\frac{1}{2}$ **b.** $-\frac{\sqrt{3}}{3}$

c. -2 **d.** $\frac{2\sqrt{3}}{3}$

7. $\sec^2 135° + 2 \sin 210°$ **7.** _____

a. 1 **b.** $-1-\sqrt{2}$

c. $\frac{2\sqrt{2}-1}{2}$ **d.** $-\frac{3\sqrt{2}}{2}$

8. $4(\sin 30°)(\sec 135°) + \tan^2 225°$ **8.** _____

a. $\frac{1+2\sqrt{6}}{3}$ **b.** $\frac{3-2\sqrt{2}}{2}$

c. $1-2\sqrt{2}$ **d.** $-1+2\sqrt{2}$

9. Determine which of the following is *not* true. **9.** _____

a. csc 22° < csc 72° **b.** sec 45° < sec 65°

c. tan 18° < tan 73° **d.** cos 29° < cos 24°

10. Determine which of the following is true. **10.** _____

a. sin 45° + cos 45° = tan 45°

b. sec 45° + csc 45° = 4 sin 45°

c. cos 30° + tan 30° = sin 30°

d. tan 60° + tan 30° = tan 90°

A calculator may be used for Problems 11-20.

Find a decimal approximation for each.

11. tan 753° 24′ **11.** _____

a. –.6594 **b.** .3406

c. .2133 **d.** .6594

12. csc 219.44° **12.** _____

a. –.6353 **b.** .8223

c. –1.295 **d.** –1.574

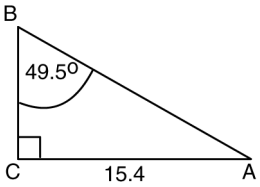
Find an angle in the interval [0°, 90°) that satisfies each statement. Give answers to the nearest tenth of a degree.

13. sec $\theta = 1.2938$ **13.** _____
a. 24.5° **b.** 39.4°
c. 50.6° **d.** 72.3°

14. cot $A = 6.3847$ **14.** _____
a. 8.9° **b.** 22.3°
c. 42.8° **d.** 90.1°

Solve each of the following right triangles. The right angle is at C.

15. **15.** _____



a. $a = 20.2$, $c = 13.7$, $A = 41.4°$
b. $a = 18.1$, $c = 23.8$, $A = 54.6°$
c. $a = 13.2$, $c = 20.3$, $A = 40.5°$
d. $a = 13.1$, $c = 28.5$, $A = 51.4°$

16. $a = 4.6$, $c = 8.7$ **16.** _____
a. $b = 9.8$, $A = 43.2°$, $B = 46.8°$
b. $b = 4.1$, $A = 61.9°$, $B = 28.1°$
c. $b = 2.3$, $A = 25.7°$, $B = 64.3°$
d. $b = 7.4$, $A = 31.9°$, $B = 58.1°$

17. $B = 68°$, $b = 5.6$ **17.** _____
a. $a = 2.3$, $c = 6.0$, $A = 22°$
b. $a = 14.9$, $c = 13.8$, $A = 68°$
c. $a = 9.3$, $c = 14.9$, $A = 32°$
d. $a = 7.8$, $c = 13.2$, $A = 74°$

18. The observer deck of a ship is located at the origin of a coordinate system. Find the bearing of a buoy located at the point (8, –8). **18.** _____
a. 45° **b.** 135°
c. 225° **d.** 315°

19. A scientist is at a spot that has an angle of elevation of 22.7° to the top of the 315-foot-tall observatory. How far is the scientist from the base of the observatory? **19.** _____
a. 341 ft **b.** 753 ft
c. 816 ft **d.** 1003 ft

20. A sailboat travels 6 miles on a bearing of 48°, and then it travels on a bearing of 138° for 22 miles. How far is the sailboat from its starting position?

a. 12 mi **b.** 15 mi
c. 20 mi **d.** 23 mi

20. _____

CHAPTER 2, FORM A

1. cos 60° 28′
2. $\csc A = \frac{w}{120}$; $\sec A = \frac{w}{147}$; $\cot A = \frac{147}{120}$
3. $z = 3.75°$
4. $d = \frac{91}{9}^\circ$
5. b
6. $-\frac{\sqrt{3}}{3}$
7. $\frac{9-4\sqrt{3}}{12}$
8. -7
9. False
10. False
11. –.3398324552
12. 1.042626068
13. 27.0°
14. 6.9°
15. $B = 69°$; $a = 54$; $b = 140$
16. $A = 35.6°$; $B = 54.4°$; $a = 436$
17. $B = 48°$ $b = 54.6$; $c = 73.5$
18. 315°
19. 84 ft
20. 5.4 mi

CHAPTER 2, FORM B

1. csc 60° 09′
2. $\csc A = \frac{29}{20}$; $\sec A = \frac{29}{21}$; $\cot A = \frac{21}{20}$
3. $b = 5°$
4. $B = \frac{71}{4}^\circ$
5. a
6. $-\sqrt{3}$
7. $\frac{8-3\sqrt{3}}{2}$
8. –5/3
9. True
10. False
11. –25.07975682
12. 1.117594957
13. 29.0°
14. 9.6°
15. $A = 55°$; $a = 96$; $b = 67$
16. $A = 46.5°$; $B = 43.5°$; $c = 58$
17. $B = 35°$; $b = 17$; $c = 29$
18. 135°
19. 451 ft
20. 44 mi

CHAPTER 2, FORM C

1. cos 1°
2. $\sin A = \frac{s}{h}$; $\cos A = \frac{135}{h}$; $\tan A = \frac{s}{135}$
3. $\theta = 4\frac{14}{19}^\circ$
4. $\beta = \frac{23}{41}^\circ$
5. a
6. 1
7. $-3\frac{1}{4}$
8. $\frac{1}{2}$
9. False
10. True
11. –0.3398324552
12. 1.042626068
13. 64.2°
14. 7.9°
15. $A = 54°$; $a = 41$; $b = 56$
16. $A = 25.9°$; $B = 64.1°$; $c = 96.7$
17. $A = 36°$; $a = 44$; $b = 61$
18. 315°
19. 26 ft
20. 24 mi

CHAPTER 2, FORM D

1. sec 27° 45′

2. $\csc A = \frac{w}{120}$;
$\sec A = \frac{w}{147}$;
$\cot A = \frac{147}{120}$

3. $z = 3.75°$

4. $w = \frac{94}{9}°$

5. b

6. 2

7. $\frac{9-4\sqrt{3}}{12}$

8. –7

9. False

10. False

11. .9731119128

12. 2.705740537

13. 52.4°

14. 85.3°

15. $B = 69°$; $a = 54$; $b = 140$

16. $A = 35.6°$; $B = 54.4°$; $a = 436$

17. $B = 48°$ $b = 54.6$; $c = 73.5$

18. 270°

19. 84 ft

20. 5.4 mi

CHAPTER 2, FORM E

1. b

2. c

3. c

4. b

5. d

6. d

7. b

8. a

9. c

10. d

11. b

12. a

13. c

14. d

15. a

16. c

17. c

18. d

19. b

20. b

CHAPTER 2, FORM F

1. d

2. a

3. b

4. b

5. c

6. d

7. a

8. c

9. a

10. b

11. d

12. d

13. b

14. a

15. c

16. d

17. a

18. b

19. b

20. d