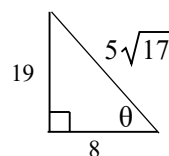|		
Student: Cole Lamers **Date:** 07/10/19	**Instructor:** Kelly Galarneau **Course:** CA&T Internet (70263) Galarneau	**Assignment:** 5.2 Right Triangle Trigonometry

1. Select the correct choice below to complete the statement.

If θ is an acute angle and **sin** $\theta = \dfrac{4\sqrt{2}}{11}$, then **cos** $\theta = \dfrac{\sqrt{89}}{11}$.

2. Find the exact values for the six trigonometric functions of the angle θ in the figure.

sin $\theta = \dfrac{19\sqrt{17}}{85}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Type an exact answer, using radicals as needed. Rationalize the denominator.)

cos $\theta = \dfrac{8\sqrt{17}}{85}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Type an exact answer, using radicals as needed. Rationalize the denominator.)

tan $\theta = \dfrac{19}{8}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Type an exact answer, using radicals as needed. Rationalize the denominator.)

csc $\theta = \dfrac{5\sqrt{17}}{19}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Type an exact answer, using radicals as needed. Rationalize the denominator.)
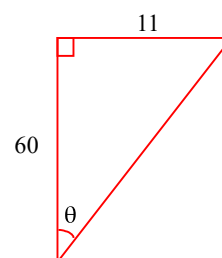
sec $\theta = \dfrac{5\sqrt{17}}{8}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Type an exact answer, using radicals as needed. Rationalize the denominator.)

cot $\theta = \dfrac{8}{19}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Type an exact answer, using radicals as needed. Rationalize the denominator.)

3. Find the exact values for the six trigonometric functions of the angle θ.

$\sin \theta = \dfrac{11}{61}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Rationalize all denominators.)

$\cos \theta = \dfrac{60}{61}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Rationalize all denominators.)

$\tan \theta = \dfrac{11}{60}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Rationalize all denominators.)

$\sec \theta = \dfrac{61}{60}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Rationalize all denominators.)

$\csc \theta = \dfrac{61}{11}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Rationalize all denominators.)

$\cot \theta = \dfrac{60}{11}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Rationalize all denominators.)

4. θ is an acute angle and **sin** θ and **cos** θ are given. Use identities to find **tan** θ, **csc** θ, **sec** θ, and **cot** θ. Where necessary, rationalize denominators.

$\sin \theta = \dfrac{4}{5}, \quad \cos \theta = \dfrac{3}{5}$

$\tan \theta = \dfrac{4}{3}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

$\csc \theta = \dfrac{5}{4}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

$\sec \theta = \dfrac{5}{3}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

$\cot \theta = \dfrac{3}{4}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

5. Use the definition or identities to find the exact value of each of the remaining five trigonometric functions of the acute angle θ.

$$\cos \theta = \frac{1}{7}$$

$\sin \theta = \boxed{\dfrac{4\sqrt{3}}{7}}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

$\tan \theta = \boxed{4\sqrt{3}}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

$\cot \theta = \boxed{\dfrac{\sqrt{3}}{12}}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

$\csc \theta = \boxed{\dfrac{7\sqrt{3}}{12}}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

$\sec \theta = \boxed{7}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

6. Find the trigonometric function value of the corresponding complementary angle.

Given that $\cot 57^\circ \approx 0.6494$, find $\tan 33^\circ$.

$\tan 33^\circ \approx \boxed{.6494}$

(Type an integer or decimal rounded to four decimal places as needed.)

7. Find the trigonometric function value of the corresponding complementary angle.

Given that $\cot 52^\circ \approx 0.7813$, find $\tan 38^\circ$.

$\tan 38^\circ \approx \boxed{.7813}$

(Type an integer or decimal rounded to four decimal places as needed.)

8. Find the trigonometric function value of the corresponding complementary angle.

Given that $\sin 70^\circ \approx 0.9397$, find $\cos 20^\circ$.

$\cos 20^\circ \approx \boxed{.9397}$

(Type an integer or decimal rounded to four decimal places as needed.)

9. Use table for trigonometric function values of some common angles and simplify the resulting expression.

$\sin 45^\circ \cos 45^\circ + \cos 30^\circ \sin 60^\circ$

$\sin 45^\circ \cos 45^\circ + \cos 30^\circ \sin 60^\circ = \boxed{\dfrac{5}{4}}$

(Simplify your answer. Type an exact answer, using radicals as needed. Type an integer or a fraction.)

10. Use table for trigonometric function values of some common angles and simplify the resulting expression.

$\cos 30^\circ \cos 45^\circ + \sin 60^\circ \sin 30^\circ$

$\cos 30^\circ \cos 45^\circ + \sin 60^\circ \sin 30^\circ = \boxed{\dfrac{\sqrt{3} + \sqrt{6}}{4}}$

(Simplify your answer. Type an exact answer, using radicals as needed. Type an integer or a fraction.)

11. Use table for trigonometric function values of some common angles and simplify the resulting expression.

$\cot 45^\circ + \csc 30^\circ$

$\cot 45^\circ + \csc 30^\circ = \boxed{3}$

(Simplify your answer. Type an exact answer, using radicals as needed.)

12. Use the figure shown to the right and the given values to find
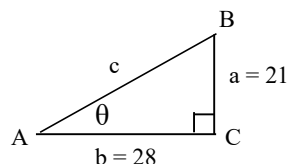   c, **sin** θ, and **tan** θ.

     a = 6, b = 11
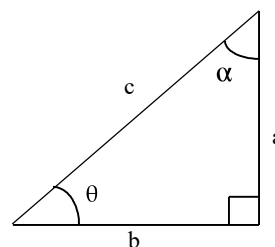
c =   12.53   (Type an integer or decimal rounded to three decimal places as needed.)

sin θ =   .479   (Type an integer or decimal rounded to three decimal places as needed.)

tan θ =   .545   (Type an integer or decimal rounded to three decimal places as needed.)

13. Use the figure below and the given values to find the specified side length and trigonometric function value. Find **cos** θ and
     tan θ.

The length of the missing side of the right triangle is c =   35   .
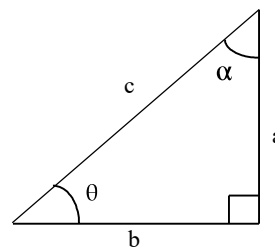
cos θ = $\dfrac{4}{5}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

tan θ = $\dfrac{3}{4}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

14. Use the figure shown to the right and the given values to find
     sin θ, b, and c.

     θ = 60°, a = 6

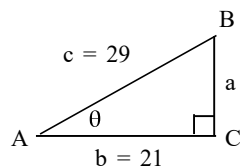**sin** θ =   .866   (Type an integer or decimal rounded to three decimal places as needed.)

b =   3.464   (Type an integer or decimal rounded to three decimal places as needed.)

c =   6.928   (Type an integer or decimal rounded to three decimal places as needed.)

15. Use the figure below and the given values to find the specified side length and trigonometric function value. Find a, **sin** θ,
     tan θ.

The length of the missing side of the right triangle is a =   20   .

sin θ = $\dfrac{20}{29}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

**tan** θ = $\dfrac{20}{21}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

16. An 18-foot ladder is resting against a wall of a building in such a way that the top of the ladder is 15 feet above the ground. How far is the foot of the ladder from the base of the building?

The foot of the ladder is approximately   10   feet from the base of the building.
(Round to the nearest foot as needed.)

17.

4183 ft   15,880 ft

4   0

a ft
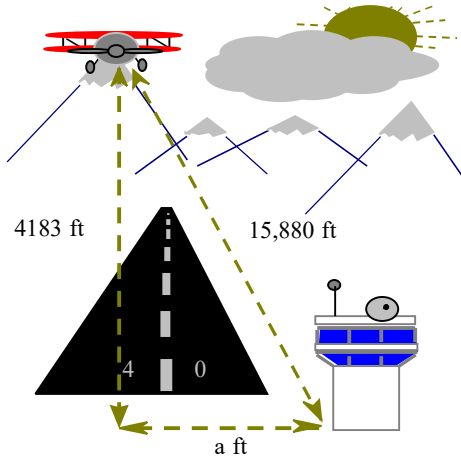
An airplane is flying at an altitude of 4183 ft. The slanted distance directly to the airport is 15,880 ft. How far is the airplane horizontally from the airport?

The airplane is   15319.168   ft from the airport.
(Simplify your answer. Type an integer or a decimal. Round to the nearest thousandth if needed.)

18. A road is inclined at an angle of 7°. After driving 4800 feet along this road, find the driver's increase in altitude. Round to the nearest foot.

The driver's increase in altitude is about   585   feet.
(Round to the nearest whole number as needed.)

19. The tallest television transmitting tower in the world is in North Dakota. From a point on level ground 5280 feet (one mile) from the base of the tower, the angle of elevation is 21.2°. Approximate the height of the tower to the nearest foot.

        2048   feet (Round to the nearest foot.)

20.

A 15.5-m fire truck ladder is leaning against a wall. Find the distance d the ladder goes up the wall (above the fire truck) if the ladder makes an angle of 59° 38' with the horizontal.

15.5 m
d
59° 38'
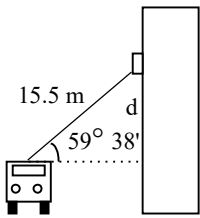
$d \approx$ 13.37   m
(Simplify your answer. Type an integer or a decimal. Round to the nearest hundredth.)

21. Find the height of a pine tree that casts a 91-foot shadow on the ground if the angle of elevation of the sun is 23°35′.

The height of the pine tree is approximately   40   ft.
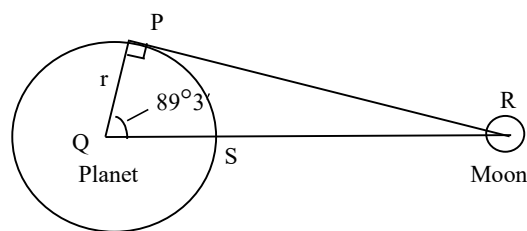(Round to the nearest integer as needed.)

22.

From a window 31.0 ft above the street, the angle of elevation to the top of the building across the street is 50.0° and the angle of depression to the base of this building is 16.0°. Find the height of the building across the street.
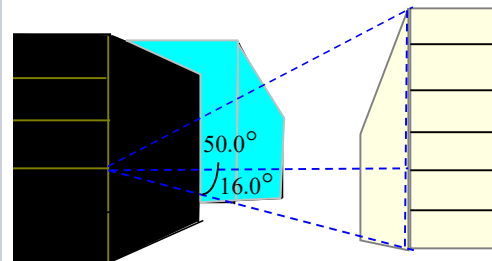
50.0°
16.0°

The height of the building across the street is   160   ft.
(Round to the nearest whole number as needed.)

23.

If the radius of a planet is r = 3765 miles and the angle at the planet's center is A = 89°3′ find the shortest distance between its moon and the surface of the planet.

The distance between its moon and the surface of the planet is approximately ____223318____ miles.
(Round to the nearest mile as needed.)

24. Use the figure to the right to find the radius of the 50th parallel of latitude (value of θ).

Use 3960 miles for the radius of Earth.
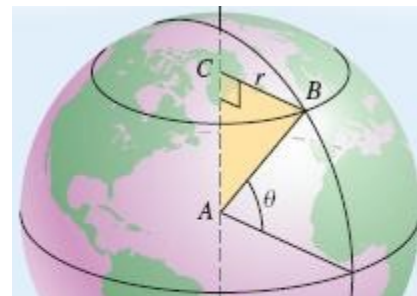
r ≈ ____2545____ miles
(Round to the nearest mile as needed.)

25.

If α is an acute angle and $\sin \alpha = \dfrac{1}{3}$, find the value of $\cos \alpha \csc \alpha + \tan \alpha \sec \alpha$.
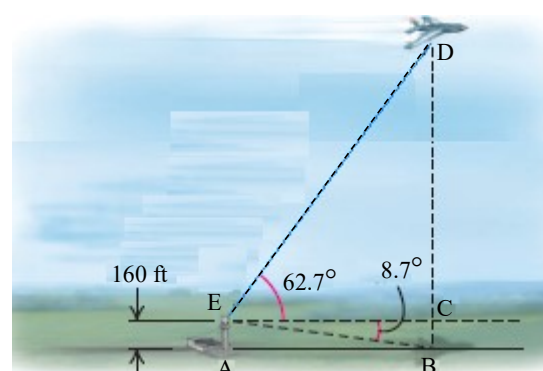
$\cos \alpha \csc \alpha + \tan \alpha \sec \alpha = \dfrac{16\sqrt{2} + 3}{8}$

(Simplify your answer. Type an exact answer, using radicals as needed.)

26.

If $\tan \theta = \dfrac{2}{11}$, find the value of $\dfrac{\cos \theta - \sin \theta}{\cos \theta + \sin \theta}$.
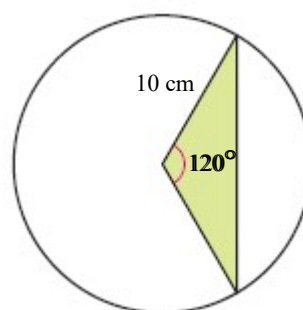
$\dfrac{\cos \theta - \sin \theta}{\cos \theta + \sin \theta} = \dfrac{9}{13}$ (Simplify your answer.)

27. From a tower 160 feet high with the sun directly overhead, an airplane and its shadow have an angle of elevation of 62.7° and an angle of depression of 8.7°, respectively. Find the height of the airplane.

The height of the airplane is approximately ____2186____ feet.
(Do not round until the final answer. Then round to the nearest integer as needed.)

28.

Find the area of the triangle in the given figure.

The area of the triangle is ____$25\sqrt{3}$____ cm^2.
(Simplify your answer. Type an exact answer, using radicals as needed.)