Trigonometry Test Review
9.1-9.4 and 10.1-10.3
Algebra 2 with Trigonometry

Solve $\triangle ABC$ using the diagram at the right and the given measurements.
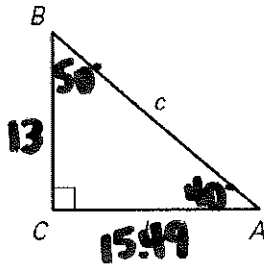Round your answers to two decimal places.

1.

$\angle A = 40°$

$\angle B = \underline{50°}$

$\angle C = \underline{90°}$

$a = 13$

$b = \underline{15.49}$

$c = \underline{20.22}$

$\tan 50° = \dfrac{b}{13}$

$\sin 40° = \dfrac{13}{c}$

$\dfrac{13}{\sin 40°} = \dfrac{c \sin 40°}{\sin 40°}$

2.

$\angle A = \underline{35°}$

$\angle B = 55°$

$\angle C = \underline{90°}$

$a = \underline{10.50}$

$b = 15$

$c = \underline{18.31}$
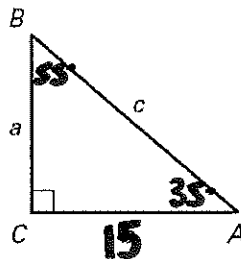
$\tan 35° = \dfrac{a}{15}$

$\sin 55° = \dfrac{15}{c}$

$\dfrac{15}{\sin 55°} = \dfrac{c \sin 55°}{\sin 55°}$

3.

$\angle A = \underline{53°}$

$\angle B = 37°$

$\angle C = \underline{90°}$

$a = \underline{14.38}$

$b = \underline{10.83}$

$c = 18$
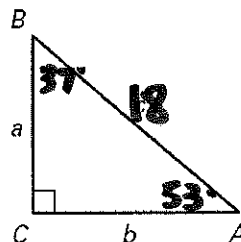
$\sin 37° = \dfrac{b}{18}$

$\sin 53° = \dfrac{a}{18}$

4. Find one positive angle and one negative angle that is coterminal with the given angle.

$125° \pm 360°$

Positive angle: **485°** (degrees)

Negative angle **-235°** (degrees)

5. Find one positive angle and one negative angle that is coterminal with the given angle.

$280° \pm 360°$

Positive angle: **640°** (degrees)

Negative angle: **-80°** (degrees)

6. Find one positive angle and one negative angle that is coterminal with the given angle.

$\dfrac{2\pi}{3} \pm 2\pi$

Positive angle: $\dfrac{8\pi}{3}$ (radians)

Negative angle: $\dfrac{-4\pi}{3}$ (radians)

7. Find one positive angle and one negative angle that is coterminal with the given angle.

$\dfrac{5\pi}{4} \pm 2\pi$

Positive angle: $\dfrac{13\pi}{4}$ (radians)

Negative angle: $\dfrac{-3\pi}{4}$ (radians)

8. Find the arc length and the area of the sector with: θr $\frac{1}{2}r^2\theta$
   (Round to the nearest two decimal places.)

A radius of 10 inches and
a central angle of $\theta = 100° \cdot \dfrac{\pi}{180} = \dfrac{5\pi}{9}$

Arc length: **17.45 in**

$\dfrac{5\pi}{9} \cdot 10$

Area of the sector: **87.27 in²**

$\dfrac{1}{2}(10)^2\left(\dfrac{5\pi}{9}\right)$

9. Find the arc length and the area of the sector with:
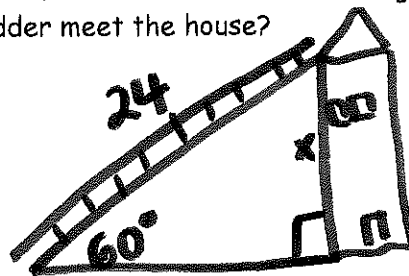   (Round to the nearest two decimal places.)

A radius of 16 feet and
a central angle of $\theta = 220° \cdot \dfrac{\pi}{180} = \dfrac{11\pi}{9}$

Arc length: **61.44 ft**

$\left(\dfrac{11\pi}{9}\right)(16)$

10. Area of the sector: **491.48 ft²**

$\dfrac{1}{2}(16)^2\left(\dfrac{11\pi}{9}\right)$

11. A stepladder has an angle of $60°$ with the front of the house. The length of the stepladder is 24 feet. At what height does the stepladder meet the house?

$$\sin 60° = \frac{x}{24}$$

round 2 decimal places

20.78 ft

Evaluate the six trigonometric functions of the angle θ. Leave your answer in simplest radical form.

12.

$b^2 = 48$
$b = 4\sqrt{3}$

$8^2 + b^2 = (4\sqrt{7})^2$
$64 + b^2 = 112$

Triangle with hypotenuse $4\sqrt{7}$, side 8, side $4\sqrt{3}$, angle θ.

$\sin\theta = \frac{8\sqrt{7}}{4\sqrt{7}\cdot\sqrt{7}} = \frac{8\sqrt{7}}{28} = \boxed{\frac{2\sqrt{7}}{7}}$

$\csc\theta = \frac{4\sqrt{7}}{8} = \boxed{\frac{\sqrt{7}}{2}}$

$\cos\theta = \frac{4\sqrt{3}\cdot\sqrt{7}}{4\sqrt{7}\cdot\sqrt{7}} = \boxed{\frac{\sqrt{21}}{7}}$

$\sec\theta = \frac{\sqrt{7}\sqrt{3}}{\sqrt{3}\sqrt{3}} = \boxed{\frac{\sqrt{21}}{3}}$

$\tan\theta = \frac{2\sqrt{3}}{4\sqrt{3}\sqrt{3}} = \boxed{\frac{2\sqrt{3}}{3}}$

$\cot\theta = \boxed{\frac{\sqrt{3}}{2}}$

Draw an angle with the given measure in standard position and find its reference angle.

13. $\dfrac{2\pi}{3}$

$\boxed{\pi/3}$ _____ (radians)

14. $220°$

$\boxed{40°}$ _____ (degrees)

Evaluate. Leave your answer in simplest radical form.

15. $\sin(300°)$

$\sin 60°$

$\boxed{-\dfrac{\sqrt{3}}{2}}$

16. $\tan\dfrac{5\pi}{4}$

$\tan\dfrac{\pi}{4} = \dfrac{1}{1} = \boxed{0}$

17. $\cos(120°)$

$\cos 60°$

$\boxed{-\dfrac{1}{2}}$

18. $\tan\dfrac{4\pi}{3}$

$\tan \pi/3 = \dfrac{\sqrt{3}}{1} = \boxed{\sqrt{3}}$

19. $\sin(-750°)$

$\sin 30°$

$\boxed{-\dfrac{1}{2}}$

20. $\sec\left(-\dfrac{5\pi}{4}\right)$

$\sec\left(\dfrac{\pi}{4}\right) = \dfrac{-\sqrt{2}}{1}$
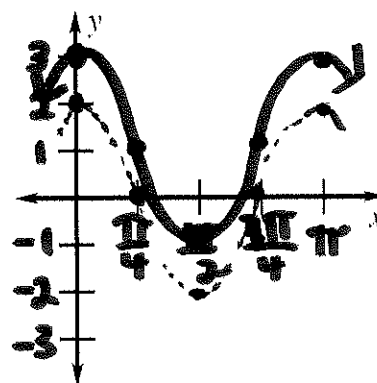
$\boxed{-\sqrt{2}}$

Graph the function. Identify the amplitude and the period of the graph of the function.

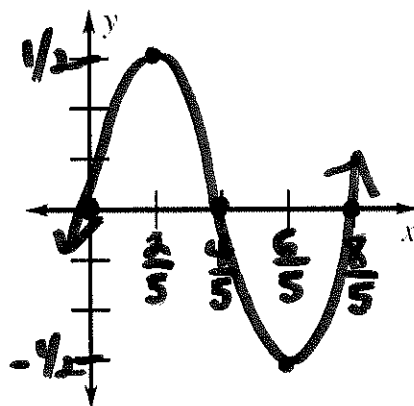| 21. $y = 4\cos \pi x$	22. $y = 2\cos 2x + 1$

21. $y = 4\cos \pi x$
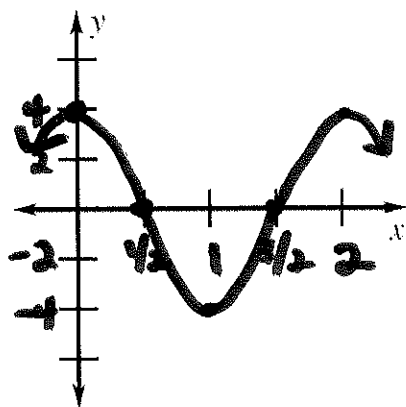
Amplitude: __4__   Period: __2__

22. $y = 2\cos 2x + 1$

up 1
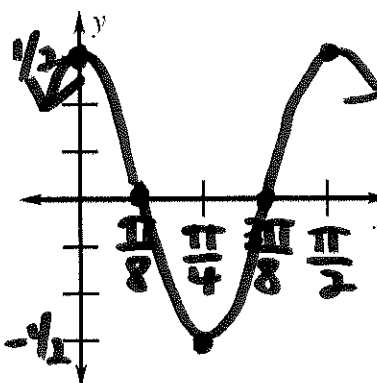
Amplitude: __2__   Period: __π__

23. $y = \dfrac{1}{2}\sin \dfrac{5}{4}\pi x$

Amplitude: __$\dfrac{1}{2}$__   Period: __$\dfrac{8}{5}$__

$\dfrac{2\pi}{\frac{5}{4}\pi} = 2\pi \cdot \dfrac{4}{5\pi}$

24. $y = \dfrac{1}{2}\cos 4x$

Amplitude: __$\dfrac{1}{2}$__   Period: __$\dfrac{\pi}{2}$__

$\dfrac{2\pi}{4}$

Find the values of the other five trigonometric functions of θ if $\tan \theta = \dfrac{-3}{4}$, $\dfrac{3\pi}{2} < \theta < 2\pi$
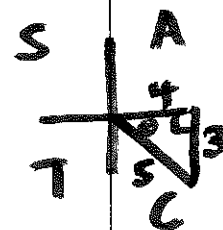
25.

$\sin \theta = \dfrac{-3}{5}$

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

$\csc \theta = \dfrac{-5}{3}$

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

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

Simplify the expression use trigonometry identities. Show all the steps.

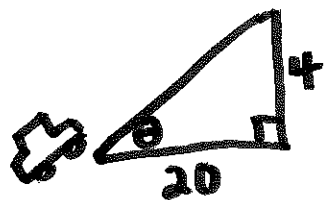|	
26. $\sec^2\theta(1-\sin^2\theta)$ $\left(\dfrac{1}{\cos^2\theta}\right)(\cos^2\theta)$ $\boxed{1}$	27. $\dfrac{\sin^2\theta+\cos^2\theta+\cot^2\theta}{}$ $1+\cot^2\theta$ $\boxed{\csc^2\theta}$
28. $\sin\theta\cot\theta$ $\sin\theta\cdot\dfrac{\cos\theta}{\sin\theta}$ $\boxed{\cos\theta}$	29. $\dfrac{\sec\theta}{\csc\theta}$ $\dfrac{\sec\theta}{1}\cdot\dfrac{1}{\csc\theta}$ $\dfrac{1}{\cos\theta}\cdot\sin\theta=\dfrac{\sin\theta}{\cos\theta}$ $=\boxed{\tan\theta}$

Solve for the indicated angle. Round to the nearest tenth of a degree.

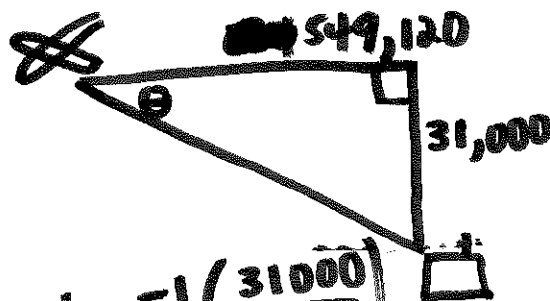|	
30. A car drives on a ramp in order to enter the parking garage. The ramp has a height of 4 feet and a horizontal length of 20 feet. What is the angle θ of the ramp? $\theta=\tan^{-1}\left(\dfrac{4}{20}\right)$ $\boxed{\theta=11.3°}$	31. An airplane is flying at an altitude of 31,000 feet when it begins its decent for landing. If the runway is 104 miles away, at what angle does the airplane descend? **(Hint: Convert)** 549,120 31,000 $\theta=\tan^{-1}\left(\dfrac{31000}{549,120}\right)$ $\boxed{\theta=3.2°}$

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