Name ___Key___   Date _____   Period _____

1. In a right triangle, θ is an acute angle and $\cos\theta = \dfrac{6}{11}$. Evaluate sinθ and tanθ.

$$\sin\theta = \frac{\sqrt{85}}{11}, \quad \tan\theta = \frac{\sqrt{85}}{6}$$

2. The shadow of a tree measures 25 feet from its base. The angle of elevation to the sun is 31°. How tall is the tree? Draw and label a right triangle to represent the problem. Round your answer to the nearest foot.

   15 ft.

#3-4: Draw the following angles in standard position. *Include arrow!*

3. 462°

4. −311°

5. Find one positive angle and one negative angle that are coterminal with 382°.

   Possible answers: −338° and 742° (22° also ok for positive answer)

#6-9: Convert the degree measure to radians or the radian measure to degrees.

6. 30°

$$\frac{\pi}{6}$$

7. −225°

$$-\frac{5\pi}{4}$$

8. $-\dfrac{3\pi}{4}$

$$-135°$$

9. $\dfrac{5\pi}{3}$

$$300°$$

#10-13: Find the reference angle θ' for the given angles.

10. 92°

   88°

11. −307°

   53°

12. 215°

   35°

13. $\dfrac{11\pi}{6}$

$$\frac{\pi}{6}$$

#14-15: Given a point on the terminal side of angle θ in standard position, find sinθ, cosθ and tanθ.

14. (24, −7)

sinθ = $\dfrac{-7}{25}$

cosθ = $\dfrac{24}{25}$

tanθ = $-\dfrac{7}{24}$

15. (−2, 9)

sinθ = $\dfrac{9\sqrt{10}}{20}$

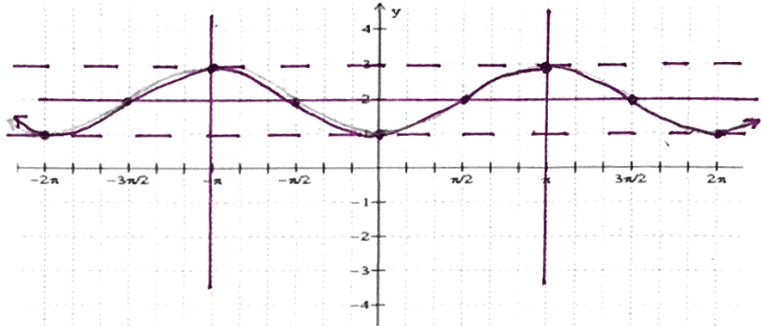cosθ = $-\dfrac{\sqrt{10}}{10}$

tanθ = $-\dfrac{9}{2}$

#16-19: Evaluate the function without using a calculator. Write your answer as an exact value.

16. $\sin 330°$

$-\dfrac{1}{2}$

17. $\cos(-405°)$

$\dfrac{\sqrt{2}}{2}$

18. $\sin\dfrac{13\pi}{6}$

$\dfrac{1}{2}$

19. $\tan\dfrac{11\pi}{3}$

$-\sqrt{3}$

#20-21: Fill in the blanks and graph the function. Show the five key points for each period.
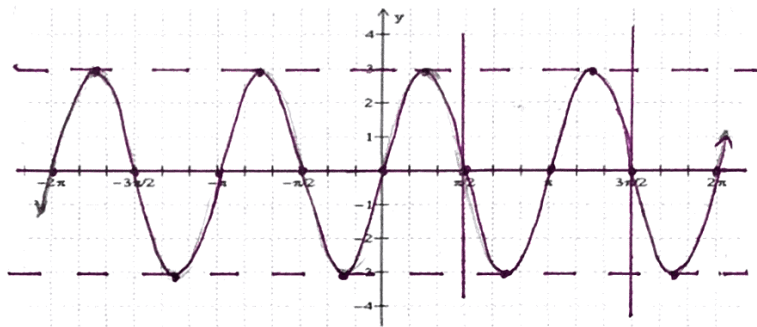
20. $y = \cos(x + \pi) + 2$

Amplitude: __1__

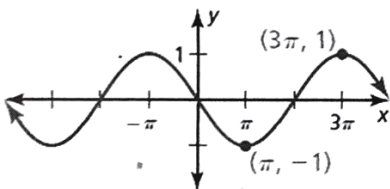Period: __2π__

Phase shift: __π left__

Vertical shift: __2 up__

21. $f(x) = -3\sin 2\left(x - \dfrac{\pi}{2}\right)$

Amplitude: __3__

Period: __π__

Phase shift: __$\frac{\pi}{2}$ right__
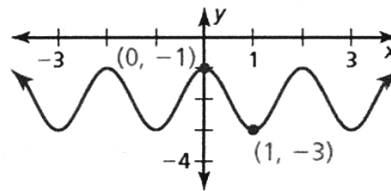
Vertical shift: __none__

#22-23: Write a function for each sinusoid. There are other correct answers.

22.

$y = -\sin\frac{1}{2}x$

23.

$y = \cos \pi x - 2$

24. You put a reflector on a spoke of your bicycle wheel. The highest point of the reflector is 25 inches above the ground, and the lowest point is 2 inches above the ground. The reflector makes one revolution per second. Write a model for the height h (in inches) of the reflector as a function of time t (in seconds) given that the reflector is at its lowest point when $t = 0$.

$h = -11.5 \cos 2\pi t + 13.5$

#25-26: Use the Pythagorean Identity and Tangent Identity to find the other two trig values.

25. $\cos\theta = \dfrac{12}{13}, \quad \dfrac{3\pi}{2} < \theta < 2\pi$

$\sin\theta = -\dfrac{5}{13}, \quad \tan\theta = -\dfrac{5}{12}$

26. $\tan\theta = \dfrac{3}{4}, \quad 0 < \theta < \dfrac{\pi}{2}$

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