

Review - Trigonometric Functions 4.1 - 4.4
NO CALCULATOR

Score: _____ of _____

Name: Key

Date: _____

Period: _____

Percent: _____

Find the value of each trigonometric function. The unit circle below is for your reference and will not be graded.

1. $\cos \frac{3\pi}{6}$

$\frac{\sqrt{3}}{2}$

2. $\cos \frac{\pi}{3}$

$\frac{1}{2}$

3. $\sec \frac{7\pi}{6}$

$-\frac{2}{\sqrt{3}}$ or $-\frac{2\sqrt{3}}{3}$

4. $\tan \frac{3\pi}{2}$

$-\frac{1}{0}$

undefined.

5. $\csc \frac{5\pi}{4}$

$-\frac{2}{\sqrt{2}}$ OR $-\sqrt{2}$

6. $\tan \frac{7\pi}{4}$

-1

7. $\cot \left(-\frac{5\pi}{4}\right)$

-1

8. $\sin \left(-\frac{\pi}{3}\right)$

$-\frac{\sqrt{3}}{2}$

9. $\sec(-\pi)$

-1

10. $\csc \left(-\frac{\pi}{6}\right)$

-2

11. $\tan \frac{23\pi}{6}$

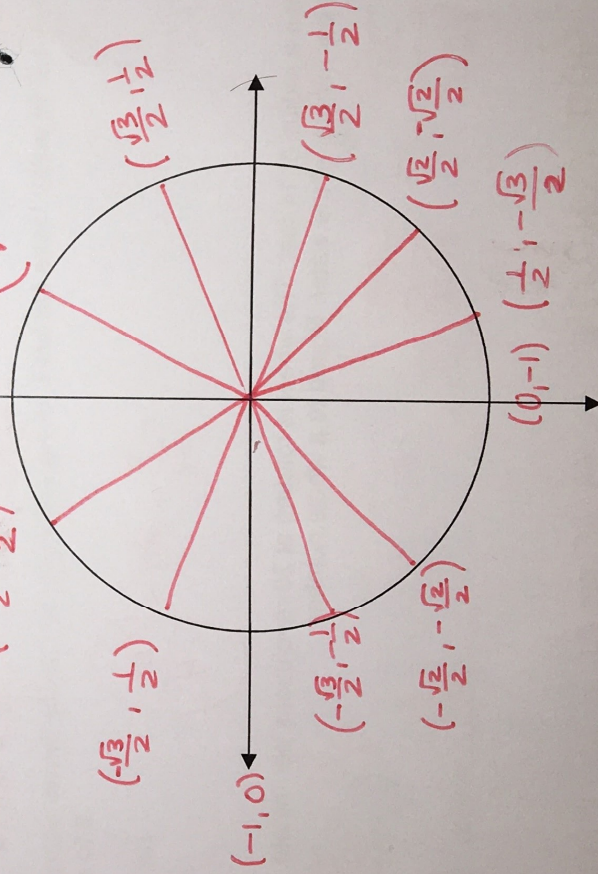
$\frac{23\pi}{6} - 12\pi = \frac{11\pi}{6}$
 $-\frac{1}{\sqrt{3}} \times \frac{\sqrt{3}}{2} = -\frac{\sqrt{3}}{2}$

$\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

12. $\cot \left(-\frac{5\pi}{6}\right)$

$\frac{-\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = \sqrt{3}$

$\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$



Convert the following angles from degrees to radians. Express your answer as a multiple of π .

13. 225°

$$225^\circ \times \frac{\pi}{180^\circ} = \frac{5\pi}{4}$$

14. 330°

$$330^\circ \times \frac{\pi}{180^\circ} = \frac{11\pi}{6}$$

Convert the following angles from radians to degrees.

15. $-\frac{2\pi}{3}$

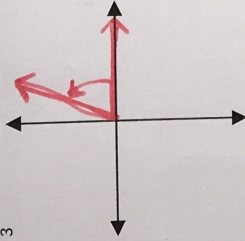
$$-\frac{2\pi}{3} \times \frac{180^\circ}{\pi} = -120^\circ$$

16. 5π

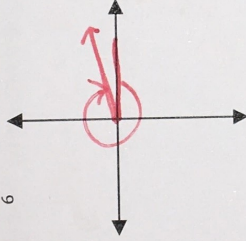
$$5\pi \times \frac{180^\circ}{\pi} = 900^\circ$$

Draw the following angles in standard position.

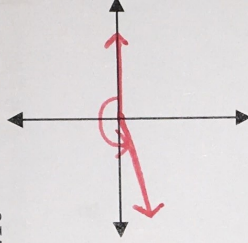
17. $\frac{\pi}{3}$



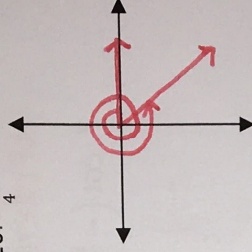
18. $-\frac{11\pi}{6}$



19. 210°



20. $\frac{15\pi}{4}$



Find a positive angle less than 2π that is coterminal with the following angles.

21. $\frac{10\pi}{3}$

$$\frac{10\pi}{3} - 2\pi = \frac{4\pi}{3}$$

22. $-\frac{25\pi}{4}$

$$-\frac{25\pi}{4} + 2\pi = -\frac{17\pi}{4} + 2\pi = -\frac{9\pi}{4} + 2\pi = -\frac{\pi}{4}$$

$$-\frac{\pi}{4} + 2\pi = \frac{7\pi}{4}$$

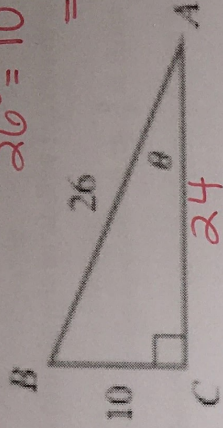
23. A water wheel has a radius of 14 feet. The wheel is rotating at 20 revolutions per minute. Find the linear speed, in feet per minute, of the water. Round to a whole number.

$$\frac{20 \text{ rev}}{\text{min}} \times \frac{2\pi}{\text{rev}} = \frac{40\pi}{\text{min}}$$

$$14 \text{ ft} \cdot \frac{40\pi \text{ radians}}{\text{min}} = \frac{560\pi \text{ ft}}{\text{min}} = 1758 \text{ ft./min}$$

24. Find the values of the six trigonometric functions of θ .

$$26^2 = 10^2 + b^2$$



$$\sin \theta = \frac{10}{26} = \frac{5}{13}$$

$$\cos \theta = \frac{24}{26} = \frac{12}{13}$$

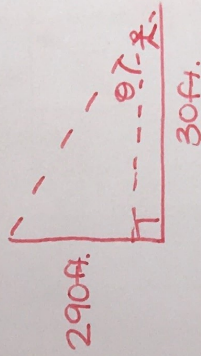
$$\tan \theta = \frac{10}{24} = \frac{5}{12}$$

$$\csc \theta = \frac{26}{10} = \frac{13}{5}$$

$$\sec \theta = \frac{26}{24} = \frac{13}{12}$$

$$\cot \theta = \frac{24}{10} = \frac{12}{5}$$

25. A building 290 feet tall casts a 30-foot-long shadow. If a person stands at the end of the shadow and looks up to the top of the building, what is the angle of the person's eyes to the top of the building (to the nearest hundredth of a degree)? (Assume the person's eyes are 4 feet above ground level.)

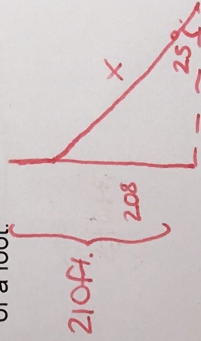


$$290 - 4 = 286 \text{ ft.}$$

$$\tan(\theta) = \frac{286}{30}$$

$$\theta = 84^\circ$$

26. A radio transmission tower is 210 feet tall. How long should a guy wire be if it is to be attached 8 feet from the top and is to make an angle of 25° with the ground? Give your answer to the nearest tenth of a foot.



$$210 - 8 = 202 \text{ ft.}$$

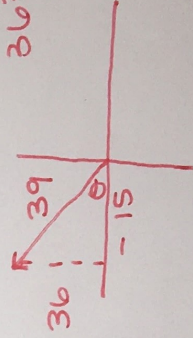
$$\sin 25^\circ = \frac{202}{x}$$

$$\frac{202}{\sin 25^\circ} = x$$

$$x = 478.0 \text{ ft.}$$

A point on the terminal side of angle θ is given. Find the exact value of the indicated trigonometric functions of θ .

27. $(-15, 36)$



$$36^2 + 15^2 = r^2$$

$$39 = r$$

$$\sin \theta = \frac{36}{39} = \frac{12}{13}$$

$$\cos \theta = \frac{-15}{39} = \frac{-5}{13}$$

$$\tan \theta = \frac{36}{-15} = \frac{-12}{5}$$

$$\csc \theta = \frac{13}{12}$$

$$\sec \theta = \frac{-13}{5}$$

$$\cot \theta = \frac{-5}{12}$$

Find the exact values of the six trigonometric functions at θ .

28. $\tan \theta = \frac{8}{3}$, $\sin \theta < 0$

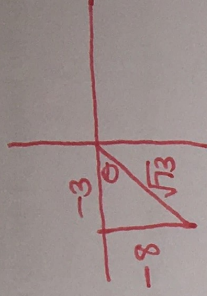
$$\sin \theta = \frac{-8}{\sqrt{73}}$$

$$\cos \theta = \frac{-3}{\sqrt{73}}$$

$$\sec \theta = \frac{\sqrt{73}}{-3}$$

$$\tan \theta = \frac{8}{3}$$

$$\cot \theta = \frac{3}{8}$$



29. $\sec \theta = \frac{7}{4}$, $\tan \theta < 0$

$$\sin \theta = \frac{\sqrt{33}}{7}$$

$$\cos \theta = \frac{4}{7}$$

$$\sec \theta = \frac{7}{4}$$

$$\tan \theta = \frac{\sqrt{33}}{4}$$

$$\cot \theta = \frac{4}{\sqrt{33}}$$

