Honors Math II

Chapter 9 day 5 (Unit Circle)

Name Key

Period_____ Date_____

Find the exact value of the following functions. Use the unit circle.

1. $\sin 135^\circ$

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

2. $\tan 240^\circ = \sqrt{3}$

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

3. $\sin(-150^\circ) = -\frac{1}{2}$

4. $\csc(-420^\circ) = -\frac{2\sqrt{3}}{3}$

reciprocal of sinθ

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

5. $\cos\frac{7\pi}{4} = \frac{\sqrt{2}}{2}$

6. $\cot\left(\frac{-8\pi}{3}\right) = \frac{\sqrt{3}}{3}$

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

7. $\tan\frac{-3\pi}{4} = 1$

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

8. $\sec\frac{11\pi}{6} = \frac{2\sqrt{3}}{3}$

reciprocal of cosθ

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

9. $\cos(-180^\circ) = -1$

10. $\tan\frac{\pi}{2} = \frac{1}{0}$ = undefined

11. $\sin 315^\circ$ $-\frac{\sqrt{2}}{2}$

12. $\cot\frac{3\pi}{2} = \frac{0}{-1} = 0$

13. In what quadrants will sine be a positive value? I & II A negative value? III & IV

14. In what quadrants will cosine be a positive value? I, IV A negative value? II, III

15. In what quadrants will tangent be a positive value? I, III A negative value? II, IV

16. In an ordered pair format on the unit circle, the sine value is associated with what coordinate value?

y-value

17. In an ordered pair format on the unit circle, the cosine value is associated with what coordinate value?

x-value

In an ordered pair format on the unit circle, how do you calculate the tangent?

$\tan\theta = \frac{\sin\theta}{\cos\theta} = \frac{y}{x}$

The terminal side of angle θ in standard position intersects the unit circle at each point P. State the value of the requested trig function.

19. $P\left(\frac{3}{5}, \frac{4}{5}\right)$

$\sin\theta = \frac{4}{5}$

20. $P\left(\frac{5}{13}, -\frac{12}{13}\right)$

$\cos\theta = \frac{5}{13}$

21. $P\left(-\frac{9}{41}, -\frac{40}{41}\right)$

$\sin\theta = -\frac{40}{41}$

Using your unit circle, find the exact value of each function. (This means no decimals!)

22. $\sin 510° = \frac{1}{2}$

23. $\cos(-45°) = \frac{\sqrt{2}}{2}$

24. $\tan(240°) = \sqrt{3}$

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

25. $\cot\frac{5\pi}{4} = 1$

26. $\cos\frac{3\pi}{2} = 0$

27. $\sec 3\pi = -1$

28. $\sin\frac{7\pi}{6} = -\frac{1}{2}$

29. $\cos\left(-\frac{4\pi}{3}\right) = -\frac{1}{2}$

30. $\tan(-\pi)$ $\frac{0}{-1} = 0$

31. What is the radius of the unit circle? 1

32. One full rotation is exactly how many radians? 2π

33. If $\cos\theta = \frac{1}{2}$ and θ is in Q IV, what is θ in radians? $\frac{5\pi}{3}$

34. If $\sin\theta = -\frac{\sqrt{3}}{2}$ and θ is in Q III, what is θ in degrees? $240°$

Not reference angle
find angle rotation from standard position

35. In which quadrant would θ be located if:

a) $\tan\theta < 0$ and $\cos\theta < 0$? $\tan\theta < 0$ 2 & 4 $\cos\theta < 0$ 2 & 3 2

b) $\sin\theta > 0$ and $\cos\theta > 0$? $\sin\theta > 0$ 1 & 2 $\cos\theta > 0$ 1 & 4 1

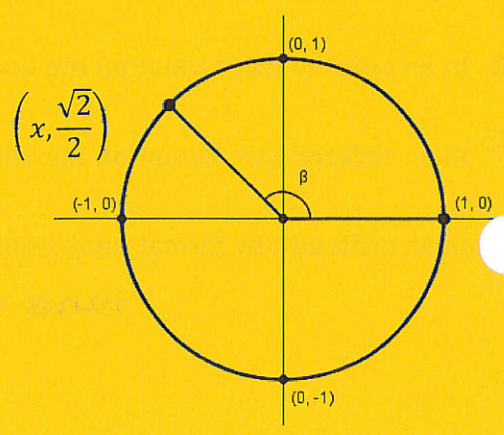
c) $\sin\theta < 0$ and $\tan\theta > 0$? $\sin\theta < 0$ 3 & 4 $\tan\theta > 0$ 1 & 3 3

36. List two angles in Q I such that $0 < \theta \le 4\pi$ and $\cos\theta = \frac{\sqrt{2}}{2}$.

(Hint: Find one angle in Q I that fits the requirements. The second angle will be coterminal to the first.)

$\frac{\pi}{4}$, $\frac{9\pi}{4}$

37. Considering the diagram shown, answer each of the questions below.



a) What is the value of x? $-\frac{\sqrt{2}}{2}$

b) What is the measure of the angle β in radians? $3\pi/4$

c) What is the value of the reference angle associated with β? $\frac{\pi}{4}$

d) What is the value of the tangent of angle β? $= -1$

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