Name: ______________________________ Date:_____________
PC: Review of Trig from Algebra 2 Ms. Loughran

The unit circle is a circle with center at the origin and radius 1.
Therefore its equation is: ________________________________
The first two trigonometric functions we will study are sine and cosine.

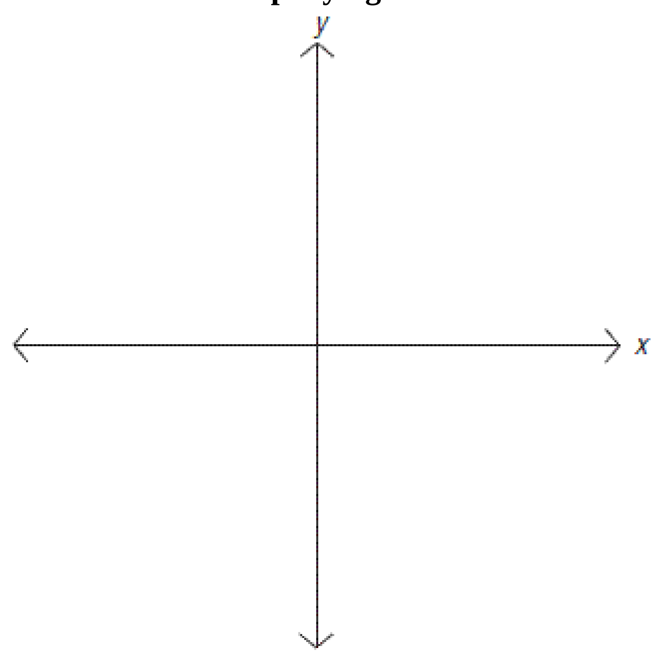
In the figure at the right, angle θ is in standard position. Point *P* represents the intersection of the unit circle and the terminal side of angle θ in standard position. We define the functions as follows:

The sine of θ is the *y*-coordinate of *P*.
The cosine of θ is the *x*-coordinate of *P*.

Also we can express tangent in terms of sine and cosine.

$$\tan\theta = \frac{\sin\theta}{\cos\theta} = \frac{y}{x}, x \neq 0$$

Notice the signs of these functions depend on the quadrant in which angle θ lies.
Draw the unit circle on the axes provided. Label the four points where the circle intersects the axes. Use those points and what we have just learned about sine, cosine and tangent to fill in the accompanying table.



θ in degrees	0°	90°	180°	270°	360°
θ in radians					
sin θ					
cos θ					
tan θ					

Pythagorean Identity: $\sin^2\theta + \cos^2\theta = 1$

(Note: it is customary to write $\sin^2\theta$ instead of $(\sin\theta)^2$ and $\cos^2\theta$ instead of $(\cos\theta)^2$.)

Exercise Set A

In 1 -8, find the sine and cosine of the given angle.

1. $90°$
2. $180°$
3. $-\frac{\pi}{2}$
4. 2π
5. $-\pi$
6. $\frac{3\pi}{2}$
7. $-90°$
8. $0°$

In 9-12, the coordinates of a point on the unit circle are given. If the terminal side of angle θ in standard position passes through the given point, find $\sin\theta$, $\cos\theta$ and $\tan\theta$.

9. $\left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$
10. $\left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$
11. $\left(-\frac{1}{3}, \frac{2\sqrt{2}}{3}\right)$
12. $\left(-\frac{\sqrt{2}}{3}, -\frac{\sqrt{7}}{3}\right)$

Given the values of $\sin\theta$, $\cos\theta$ and or $\tan\theta$, determine the quadrant in which θ lies.

13. $\sin\theta = -\frac{1}{4}, \cos\theta = -\frac{\sqrt{15}}{4}$
14. $\sin\theta = \frac{2}{3}, \tan\theta = -\frac{2\sqrt{5}}{5}$
15. $\sin\theta = \frac{3}{4}, \cos\theta = \frac{\sqrt{7}}{4}$
16. $\cos\theta = \frac{2\sqrt{5}}{5}, \tan\theta = -\frac{1}{2}$

Given the value of $\sin\theta$, $\cos\theta$ or $\tan\theta$ and the quadrant in which θ lies, find the value of the other two functions.

17. $\sin\theta = \frac{\sqrt{2}}{2}$, Quadrant I
18. $\sin\theta = -\frac{1}{2}$, Quadrant IV
19. $\cos\theta = \frac{1}{4}$, Quadrant IV
20. $\cos\theta = -\frac{4}{5}$, Quadrant II

21. $\sin\theta = -\frac{5}{13}$, Quadrant III

22. $\cos\theta = \frac{24}{25}$, Quadrant I

Evaluate.

23. $\sin\pi \cdot \cos\frac{\pi}{2}$

24. $\sin\pi + \cos\pi$

25. $\cos\frac{3\pi}{2} - \sin\frac{\pi}{2}$

26. $\sin^2\frac{3\pi}{2}$

27. $\cos^2\frac{\pi}{2} + \cos^2\left(-\frac{\pi}{2}\right)$

28. $\sin\left(-\frac{\pi}{2}\right) \cdot \cos 2\pi$

29. If $\tan\theta$ is positive and $\cos\theta$ is negative, in which quadrant does θ terminate?

30. If $\tan\theta < 0$ and $\sin\theta > 0$, in which quadrant does θ terminate?

31. If $\cos\theta < 0$ and $\tan\theta > 0$, in which quadrant does θ lie?

32. If $\sin\theta < 0$ and $\cos\theta < 0$, in which quadrant does θ terminate?

33. If $\cos\theta > 0$ and $(\cos\theta)(\sin\theta) < 0$, in which quadrant does θ lie?

34. If $\tan A > 0$ and $(\tan A)(\sin A) > 0$, in what quadrant does $\angle A$ lie?