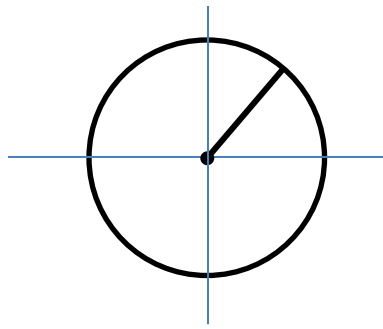


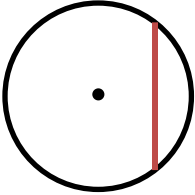
The Unit Circle

The Unit Circle is a circle with radius = _____.

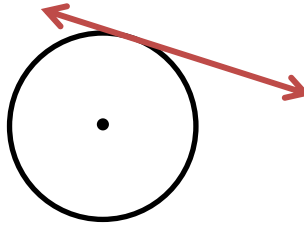
It can be used to derive all of the trig functions.



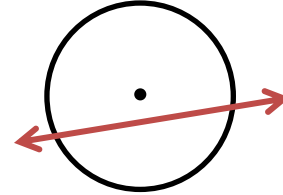
By the way, recall certain lines and segments in circles that you learned about in geometry.



A segment with both endpoints on the circle is a _____

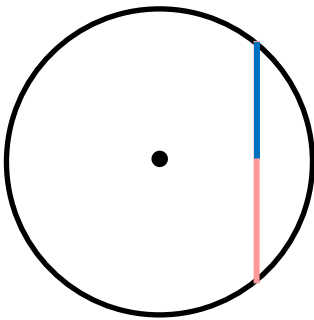


A line that touches the circle at only one point is a _____

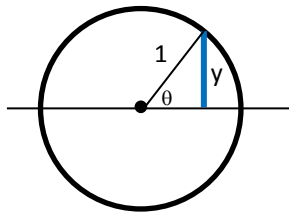


A line that crosses the circle twice is a _____

Sine: The word sine comes from the Arabic word for bosom. Sure that makes no sense, but it happened because of a poor translation. The original word meant "half of the chord".

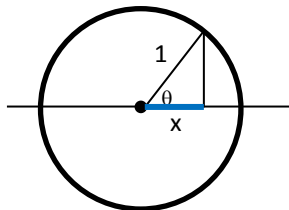
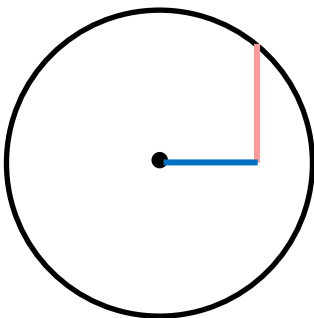


In the unit circle, the top half of the chord IS the SINE of the angle.



$$\sin\theta = \frac{\text{opp}}{\text{hyp}} = \frac{y}{1}, \text{ so } y = \sin\theta$$

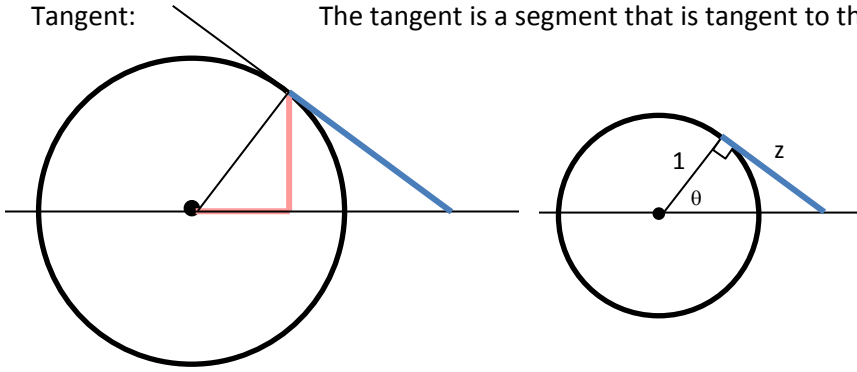
Cosine: The cosine is the "complement of sine". It is the line that connects the sine to the radius.



$$\cos\theta = \frac{\text{adj}}{\text{hyp}} = \frac{x}{1}, \text{ so } x = \cos\theta$$

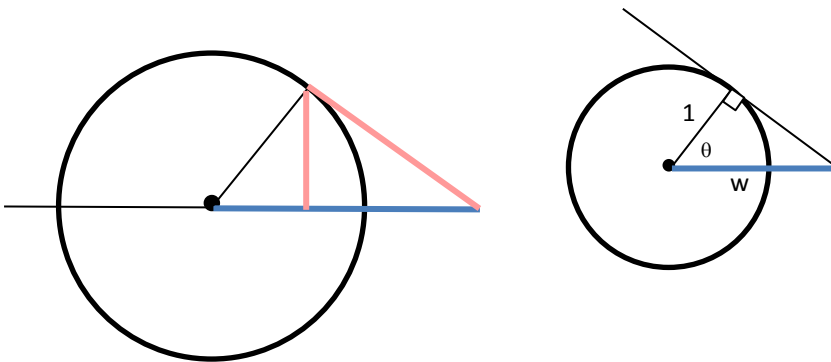
Tangent:

The tangent is a segment that is tangent to the circle.



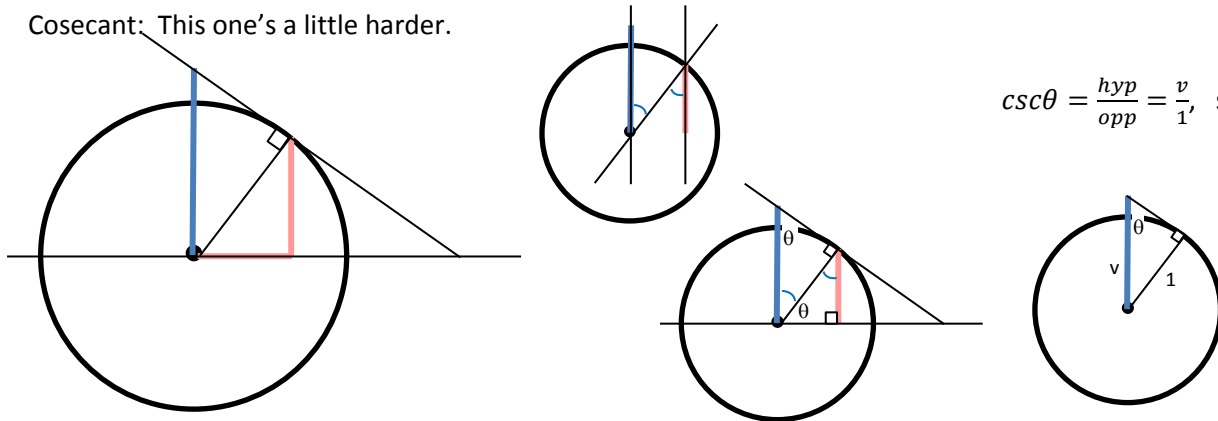
$$\tan\theta = \frac{\text{opp}}{\text{adj}} = \frac{z}{1}, \text{ so } z = \tan\theta$$

Secant: The secant is a segment from a secant line that goes through the center.



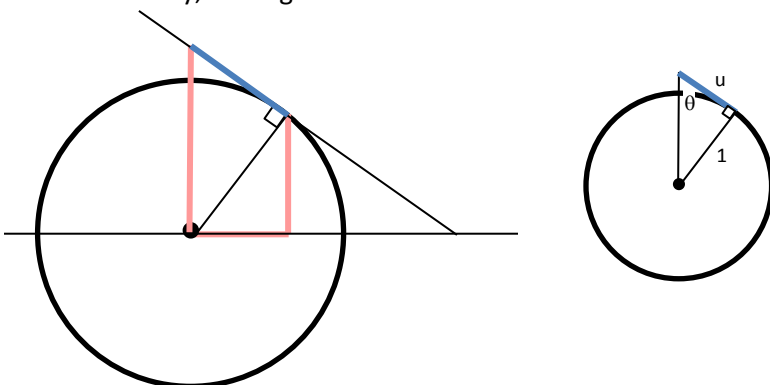
$$\sec\theta = \frac{\text{hyp}}{\text{adj}} = \frac{w}{1}, \text{ so } w = \sec\theta$$

Cosecant: This one's a little harder.



$$\csc\theta = \frac{\text{hyp}}{\text{opp}} = \frac{v}{1}, \text{ so } v = \csc\theta$$

And lastly, Cotangent:



$$\cot\theta = \frac{\text{adj}}{\text{opp}} = \frac{u}{1}, \text{ so } u = \cot\theta$$