

MATH 32 FINAL REVIEW

This is a list of the main concepts and skills we've explored in the trigonometry unit of the course. The final is cumulative (about half trig, plus a quarter each material from the first two units) - make sure you study the older material as well!

The final exam will include the angle sum, double angle, and half-angle formulas in the same format as on the practice finals. You should memorize at least the Pythagorean Identity, the Law of Sines, and the Law of Cosines.

- Measuring angles on the unit circle, in degrees and in radians
 - Conversion between degrees and radians
 - Many names (angle measures) for the same point on the circle
- Trig functions (sin, cos, tan)
 - In terms of the unit circle (the radius at angle θ meets the unit circle at the point $(\cos \theta, \sin \theta)$ and has slope $\tan \theta$)
 - In terms of ratios of sides of right triangles (sohcahtoa)
 - sec, csc, cot as reciprocals of cos, sin, tan
 - Values of sin, cos, tan on the special angles $\pi/6, \pi/4, \pi/3$.
- Basic trig identities from the unit circle picture (Examples: $\tan(\theta) = \tan(\theta + \pi)$, and $\sin(-\theta) = -\sin(\theta)$).
- Areas via trigonometry
 - Area of a triangle: $\frac{1}{2}ab \sin(\theta)$ (here θ is the angle between the sides a and b)
 - Area of the portion of a circle (of radius r) with interior angle θ : $\frac{1}{2}\theta r^2$
 - Arc length of the portion of a circle (of radius r) with interior angle θ : θr .
- Trig identities (and how to use them!)
 - The Pythagorean Identity: $\cos^2 \theta + \sin^2 \theta = 1$, and also: $1 + \tan^2 \theta = \sec^2 \theta$
 - The Law of Sines and Law of Cosines
 - The Double angle formulas, half angle formulas, and angle sum formulas
 - Deriving trig identities (start from one side, and work to reach the other side)
- Applications of trig identities
 - Determining sides and angles on a triangle from partial information (useful: the Law of Sines and the Law of Cosines, or the Pythagorean Theorem and “sohcahtoa” if it’s a right triangle)
 - Determining values of sin, cos, and tan on angles related to the special angles (useful: basic trig identities, double angle, half angle, and angle sum formulas).
- Inverse trig functions
 - The standard restricted ranges of inverse trig functions
 - Composing trig and inverse trig functions
 - Solving equations involving trig functions
- Graphs of trig functions
 - Period (affected by stretching horizontally)
 - Amplitude (affected by stretching vertically)
 - Horizontal shifts (phase shifts) and vertical shifts
 - Modeling “wave-like” functions using trig functions