



Present

The Twisted World of Trigonometry (Part 1)

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I. Angles and Their Measurements

A. Terms

1. Angles
2. Rectangular coordinate system
3. Quadrants

B. Degree and Radian Measurement

1. Converting from degrees to radians
2. Converting from radians to degrees

II. Right Triangle Trigonometry

A. The Pythagorean Theorem

1. Parts of a triangle

B. Six Trig Functions

1. Reciprocal values
2. Complimentary angles
3. Cofunctions
4. Finding trig function values

C. Trigonometric Values

1. Trig functions of special angles
2. Using your calculator
3. Finding inverse trig functions

D. Solving Right Triangles

III. Oblique Triangles

A. Law of Sines

1. Solving the ASA triangle

B. Law of Cosines

1. Solving the SAS triangle

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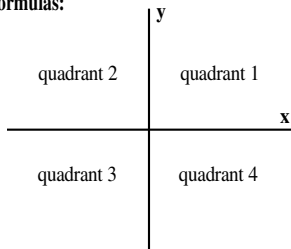
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PART 1

Formulas:



To Find A Radian Value

$$1^\circ = \frac{\pi}{180} \text{ radians}$$

To Find A Degree Value

$$1 \text{ radian} = \frac{180^\circ}{\pi}$$

The Special Angles' Degree and Radian Measurements

Degrees	Radians	Degrees	Radians
0°	0	210°	7/6
30°	1/6	225°	5/4
45°	1/4	240°	4/3
60°	1/3	270°	3/2
90°	1/2	300°	5/3
120°	2/3	315°	7/4
135°	3/4	330°	11/6
150°	5/6	360°	2
180°			

The Special Angles' Trig Function Values

$$\sin(30^\circ) = \frac{1}{2} = \cos(60^\circ) \quad \csc(30^\circ) = \frac{2}{1} = \sec(60^\circ)$$

$$\cos(30^\circ) = \frac{\sqrt{3}}{2} = \sin(60^\circ) \quad \sec(30^\circ) = \frac{2}{\sqrt{3}} = \csc(60^\circ)$$

$$\tan(30^\circ) = \frac{1}{\sqrt{3}} = \cot(60^\circ) \quad \cot(30^\circ) = \frac{\sqrt{3}}{1} = \tan(60^\circ)$$

$$\sin(45^\circ) = \frac{\sqrt{2}}{2} = \cos(45^\circ) \quad \csc(45^\circ) = \frac{2}{\sqrt{2}} = \sqrt{2}$$

$$\tan(45^\circ) = 1 \quad \cot(45^\circ) = 1$$

The Special Angles' Trig Function Values (continued)

$$\tan(45^\circ) = 1 \quad \cot(45^\circ) = 1$$

$$\sin(0^\circ) = 0 = \cos(90^\circ) \quad \csc(0^\circ) = \text{undefined} = \sec(90^\circ)$$

$$\cos(0^\circ) = 1 = \sin(90^\circ) \quad \sec(0^\circ) = 1 = \csc(90^\circ)$$

$$\tan(0^\circ) = 0 = \cot(90^\circ) \quad \cot(0^\circ) = \text{undefined} = \tan(90^\circ)$$

The Pythagorean Theorem

$$a^2 + b^2 = c^2$$

The Six Trig Functions

$$\sin(\theta) = \frac{\text{OPP}}{\text{HYP}} \quad \csc(\theta) = \frac{\text{HYP}}{\text{OPP}}$$

$$\cos(\theta) = \frac{\text{ADJ}}{\text{HYP}} \quad \sec(\theta) = \frac{\text{HYP}}{\text{ADJ}}$$

$$\tan(\theta) = \frac{\text{OPP}}{\text{ADJ}} \quad \cot(\theta) = \frac{\text{ADJ}}{\text{OPP}}$$

For Oblique Triangles

- If the last known value, moving from left to right, is a side then use the law of cosines.
- If the last known value, moving from left to right, is an angle then use the law of sines.

Law of Sines

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

Law of Cosines

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$b^2 = a^2 + c^2 - 2ac \cos B$$

$$c^2 = a^2 + b^2 - 2ab \cos C$$