Trigonometric function worksheet pdf

Home > Mathematical Topics > Trigonometry > What Are Common Trigonometric Functions? In mathematics, trigonometric functions are also called circular, goniometric, and angular functions. These are real functions, and all are related to the right angle triangle. These functions are mainly used in geometry especially for navigation, geodesy and celestial mechanics in the professional world. There are six trigonometric functions in total. All six functions are derived using a right-angle triangle. There are three sides in a right angle triangle: hypotenuse, opposite (perpendicular), and adjacent side (base). Here the six Trigonometric Functions found in mathematics. In order of the Abbreviation Name-Function-Relationship-Ratio; they can be declared as: Sine A - Sin A - OPP / HYP | Cosine A - Cos A - ADJ / HYP | Tangent A - - Tan A - OPP / ADJ | Cosecant A - Csc A - HYP / OPP | Secant A - Sec A - HYP / ADJ | Cotangent A - Cot A - ADJ / OPP | It is important to note that there are only three basic Trigonometric Functions as cosec is the inverse of sine, sec is the inverse of cos, and cotangent is the inverse function of a tangent. Students can use this collection of worksheets and classes to learn how to approach and use trigonometric functions. Cos to Sin Step-by-Step Lesson- A lot of theory goes into understanding and explaining this. Guided Lesson - More transformations from: Tan for Cosec, Sin to Tan, and Cos to Cot. Explanation of the guided lesson - Looking back, I could have saved some paper here condensing the theory into one. But that's more complete. Practice Spreadsheet - If there is such a thing, this is a job of drilling and skill on this topic. Instead of the crazy minute; consider it a hurried hour. Corresponding Worksheet - Most students will jump to the calculator for these. I wrote them as fractions to minimize the help calculators they can give you. We use trigonometric functions to associate the angles of the triangle with the sides of that triangle. In addition, we use them to study and solve problems related to triangles. We use right angle triangle to define trigonometric functions for angle. A function relates the angle to both sides of a right triangle. First, understand the sides of the triangle. Hypotenuse- It is the opposite and longest side of the right triangle. Theta - Hipotenuse is also the location opposite the angle. Theta and Right Angle - the adjacent side of the triangle contains both angles that are angle and right. Relationship Between Trigonometric Functions and Sides of the Triangle : The connection between the two is as follows: Sine(theta)= opposite/hypotenuse, Cosecant(theta)= hypotenuse/opposite, Cosine(theta)= adjacent/hypotenuse, Secant(theta)= hypotenuse/adjacent, Tangent(theta)= opposite/adjacent, Cotangent(theta)= adjacent/opposite. What is the practical way to use these functions? You can solve a problem with this practical way of using these functions: The inclined angle of the is 23 degrees, the length of your altitude altitude 2500 meters. The purported value of Hypotenuse is x. Find the value of x. Here, we will use Sin. Sin(23)=2500m / x, x = 6398.3 meters. With this collection of spreadsheets you are interlocking yourself with these common functions and evaluating conversions between them. These worksheets explain how to resolve trigonometric functions. Your students will use these worksheets to learn how to simplify and find the values of different trigonometric functions. Students should already be familiar with sine, cosine, tangent, cotangent, secant and cosecant. Page 2 [Home] This spreadsheet is a PDF document. You'll need Adobe Acrobat Reader to view the spreadsheet or responses. Each worksheet can consist of multiple pages, scroll until you see everything. Related Topics: More Lessons for Algebra II Math Worksheets Examples, videos, spreadsheets, solutions and activities to help Algebra 2 students learn about trigonometric function: Sin, Cos, Tan and the reciprocal trigonometric functions Csc, Sec and Cot. Half-angle formulas, Product and Soma Formulas. The following diagram shows tririg identities: Reciprocal Identities, Pythagoras Identities, Half Angle Formulas, Sum, and Product Formulas. Scroll through the page for more examples and solutions on trigonometric identities. Reciprocal trigonometric functions There are three reciprocal trigonometric functions, totaling six, including cosine, sine, and tangent. The reciprocal cosina function is secant: secφ = 1/cosφ. The reciprocal sine function is cosecant, cscφ = 1/sinφ. The reciprocal tangent function is cotangent, expressed in two ways: cotφ = 1/tanφ or cotφ = cosφ/sinφ. How to define reciprocal trigonometric functions, reciprocal identities, and Pythagorean identities using the unit circle? Show Step-by-step Solutions Fundamental trigonometric identities: Reciprocal, quotient, and pythagorean identities Use reciprocal, quotient, and pythagoric identities to determine trigonometric function values. Show Solutions step by step Trigonometry Functions - Sin, Cos, Tan, Csc, Sec and Cot Tangent, cotangent, secant, and cosecant from any angle Show Step by Step Solutions This tutorial covers reciprocal identities and shows them in various ways. Show step-by-step solutions Product to add identities and sum to product formulas This trigonometry tutorial explains how to simplify trigonometric expressions using the product to add identities and how to find the exact value of trigonometric expressions using the sum of product formulas. Show Step-by-Step Solutions Try the free mathway calculator and troubleshooter below to practice various math topics. Try the data examples or type your own problem and check your answer with step-by-step explanations. We welcome your comments, comments and questions on this site or page. Send your comments or questions through the Comments page. Level 6-7 First we need to be able to label each side of a straight angular triangle: The hypotenuse is always the longest is the opposite of the right angle. The opposite side is the opposite side of the angle. The adjacent side is the adjacent side (next to) the angle. \textcolor{purple}{\sin(x)}=\dfrac{\textcolor{\text}{\text{{\textcolor{\text{\text{\text{hypotenuse}} \textcolor{purple}{\cos(x)}=dfrac{\textcolor{limegreen}\adjacent{{{{text{{\textcolor{blue}{\text{hypotenuse}} \textcolor{purple}\tan(x))=\dfrac{\textcolor{\text}{\text{opposite}}{\textcolor{limegreen}{\text{'\text{'\text{adjacent}}} If we let The be the opposite, A be adjacent and H is the hypotenuse, then these are shortened to : As a result, the acronym: SOHCAHTOA is useful for remembering which sides go with which function. Find the length of the side marked y to 1 dp. [2 brands] First, we need to find which equation we need to use. We have the hypotenuse \textcolor{blue}{H} = \textcolor{blue}{12} cm We also have the adjacent side \textcolor{limegreen}{A} = \textcolor{limegreen}{y} So then, if \textcolor{limegreen}{A} and \textcolor{blue}{H} are the two sides we're working with, then it's the '\textcolor{purple}{C}{limecolor{limegreen}{A}\textcolor{blue}{H}' part of SOHCAHTOA that we need to use. \textcolor{purple}{\cos(x)}=\dfrac{\textcolor{limegreen}{A}}\textcolor{blue}{H}} Replacing on both sides and an angle, we receive: \textcolor{roxo}{\cos(38°)} =\dfrac{\textcolor{limegreen}{y}{\textcolor{blue}{12}} Next, we need to solve the equation. Multiplying both sides by 12 gives us: \textcolor{limegreen}{y}=\textcolor{blue}{12} \textcolor{purple}{\cos(38°)} Putting this in our calculator we have: \textcolor{limegreen}{y}=9.456129043... \textcolor{limegreen}{y}=9.5 cm (1 dp) Find the size of the z angle at 2 sf. [2 brands] First of all, we need to find out which equation we need to use. We have the opposite side = \textcolor{red}{5} mm We also have the adjacent side = \textcolor{limegreen}{8} mm As we are working with \textcolor{red}{O} and \textcolor{limegreen}{A}, then'\textcolor{purple}{T}\textcolor{red}{O}\textcolor{limegreen}{A}' is the part of SOHCAHTOA that we will use: \textcolor{purple}\tan(z)}=\dfrac{\text{\text{{red}{{{{text{limegreen}{A}} Replacement on the two known sides gives us : \textcolor{purple}{\tan(z)}=\dfrac{\textcolor{red}{5}}{\textcolor{limegreen}{8}} Now, as before we wanted to solve the equation to find our lost angle, z. To solve this, we need to use the reverse tanning function \tan^{-1}. What this means is that if we apply '\tan^{-1}' to both sides of the equation above, it will cancel the tan. We have: \textcolor{purple}{\tan(z)}=\dfrac{\textcolor{red}{5}}{\textcolor{limegreen}{8}} z=\textcolor{purple}{\tan}^{-1}{-left(\dfrac{\textcolor{red}{5}}{\textcolor{limegreen}{8}}\right) z=32.00538321... z=32\degree (2 sf) This works the same way with \sin and \cos; you will need to use \sin^{-1} and \cos^{-1}. In this case, the two sides that concern us are the hypotenuse and the side adjacent to the given angle. So we want the 'CAH' part of the 'SOH CAH' where A=35,H=p, and the angle is 43\degree: \cos(43°)=\dfrac{35}{p} Then we need to solve for p. Multiplying both sides by p to get: p\times\cos(43°)=35 So as \cos(43°) is just a number, we can divide both sides by \cos(43°): p=\dfrac{35}{\cos(43°)} Finally, putting this in the calculator we have: p=47.85646... p=47.9 m (3 sf) The two sides we are working on are the mortgage and the opposite side, so we want the 'SOH' part of 'SOH CAH TOA', where O=13,H=15, and the angle is q°: \sin(q)=\dfrac{13}{15} Find q, we have to apply the reverse function of the sine to both sides. It cancels the sin on the left side and we have: q=\sin^{-1}\left(\dfrac{13}{15}\right) q=60.073565... q=60.1\degree (1 sd). According to soh CAH TOA, the sin of w should be equal to the opposite side divided by the hypotenuse. The opposite side is given to us: 2, but the hypotenuse is not. Since we have a right-angle triangle, we can use Pythagoras to find the hypotenuse. If the hypotenuse is c, then a and b are both 2, so that equation a^2+b^2=c^2 becomes: c^2=2^2+2^2=4+4=8 Square rooting both sides, we have: c=\sqrt{8}=2\sqrt{2} Now we have the hypotenuse, we can use 'SOH': \sin(w)=\dfrac{2}{2\sqrt{2}} Note that there is a 2 at the top and bottom that can cancel : \sin(w)=\dfrac{2}{2\sqrt{2}}=\dfrac{1}{\sqrt{2}} In this case, the two sides we are working with are the hypotenuse and the side opposite the given angle. Therefore, we want the 'SOH' part of 'SOH CAH TOA' where O=CB,H=12, and the angle is 30\degree: \sin(30°)=\dfrac{CB}{12} Then we can solve this by multiplying both sides by 12 to get: 12\sin(30°)=CB Finally, putting this in the calculator we have: CB=6.00 cm (3 sf) The two sides with which we are working are the adjacent ones and the opposite. Therefore, we want the 'TOA' part of 'SOH CAH TOA', where O=4,A=7, and the angle is x: \tan(x)=\dfrac{4}{7} To find x, we have to apply the inverse tangent function to both sides. It cancels the tan on the left side and we have: x=\tan^{-1}\left(\dfrac{4}{7}\right)=29.7448813... x=29.7° (1 sd). dp).