

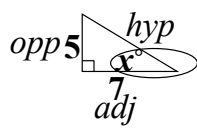
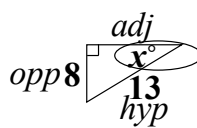
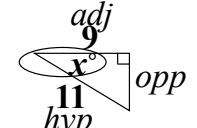
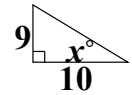
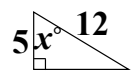
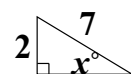
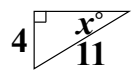
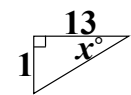
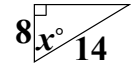
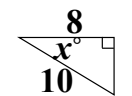
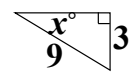
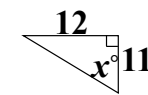
Using Trig to Determine Angles and Sides

Determining Angles

Step 1. Use SohCahToa to set up your ratio **using the angle you want**

Step 2. Use long division to re-write your fraction as a decimal to 4 places

Step 3. Use subtraction to find the closest value on the trigonometry table.

<p>EXAMPLE</p>  <p><i>S o h C a h T o a</i> 5 7 5 7</p> $\tan(x^\circ) = \frac{5}{7}$ $\tan(x^\circ) = 0.7143$ <p>35° 0.7002 or 36° 0.7265</p> <table style="border-collapse: collapse; margin-left: 20px;"> <tr><td style="border-right: 1px solid black; padding-right: 5px;">0.71428</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">50000</td><td>7</td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">-49</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">10</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">-7</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">30</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">-28</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">20</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">-14</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">60</td><td></td></tr> </table> <p>36° is closer, so $x^\circ = \boxed{36^\circ}$</p>	0.71428		50000	7	-49		10		-7		30		-28		20		-14		60		<p>EXAMPLE</p>  <p><i>S o h C a h T o a</i> 8 13 13 8</p> $\sin(x^\circ) = \frac{8}{13}$ $\sin(x^\circ) = 0.6154$ <p>37° 0.6018 or 38° 0.6157</p> <p>38° is closer, so $x^\circ = \boxed{38^\circ}$</p> <table style="border-collapse: collapse; margin-left: 20px;"> <tr><td style="border-right: 1px solid black; padding-right: 5px;">0.61538</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">80000</td><td>13</td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">-78</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">20</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">-13</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">70</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">-65</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">50</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">-39</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">110</td><td></td></tr> </table>	0.61538		80000	13	-78		20		-13		70		-65		50		-39		110		<p>EXAMPLE</p>  <p><i>S o h C a h T o a</i> 11 9 11 9</p> $\cos(x^\circ) = \frac{9}{11}$ $\cos(x^\circ) = 0.8182$ <p>35° 0.8192 or 36° 0.8090</p> <p>35° is closer, so $x^\circ = \boxed{35^\circ}$</p> <table style="border-collapse: collapse; margin-left: 20px;"> <tr><td style="border-right: 1px solid black; padding-right: 5px;">0.81818</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">90000</td><td>11</td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">-88</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">20</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">-11</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">90</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">-88</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">20</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">-11</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">90</td><td></td></tr> </table>	0.81818		90000	11	-88		20		-11		90		-88		20		-11		90	
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Determining Sides

Step 1. Use SohCahToa to set up your ratio using any angle **that is not the right angle**

To use the unknown angle, you must first find its value. So, subtract 90 minus the known angle (90° - angle = other angle)

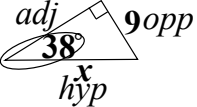

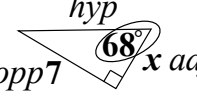
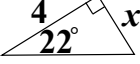
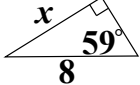
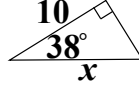
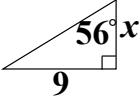
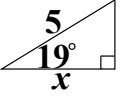
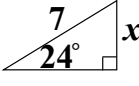
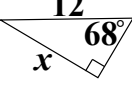

Step 2. Isolate "x" by putting the trig over 1 and cross-multiplying.

If x was on top of the fraction, this step is finished.

If x was on the bottom of the fraction, you will need to divide by your trig to get x alone.

Step 3. Use the table of values to replace the trig with the decimal that it equals

Step 4. Multiply (if x was on top) or divide (if x was on bottom) to get your answer

<p>EXAMPLE</p>  <p>S o h C a h T o a $\frac{9}{x} = \sin(38^\circ)$ $x \sin(38^\circ) = 9$ $x = \frac{9}{\sin(38^\circ)}$ $x = \frac{9}{0.6157}$ $x = 14.6$</p> <p><i>x on the bottom is long division, but, since it's not tangent, I can't change the fraction.</i></p> $\begin{array}{r} 14.61 \\ 6157 \overline{) 90000.00} \\ \underline{-6157} \\ 28430 \\ \underline{-24628} \\ 38020 \\ \underline{-36942} \\ 10780 \end{array}$	<p>EXAMPLE</p>  <p>S o h C a h T o a $\frac{8}{x} = \cos(56^\circ)$ $8 \cos(56^\circ) = x$ $x = 8 \cos(56^\circ)$ $x = 8(0.5592)$ $x = 4.5$</p> <p>$\begin{array}{r} 4 \ 4 \ 7 \ 1 \\ 0.5592 \\ \underline{x \ 8} \\ 4.4736 \end{array}$</p>	<p>EXAMPLE</p>  <p>S o h C a h T o a $\frac{7}{x} = \tan(68^\circ)$ <i>Switching angles switches opp & adj:</i> S o h C a h T o a $\frac{x}{7} = \tan(22^\circ)$ $90 - 68 = 22$, so ... $\tan(22^\circ) = \frac{x}{7}$ $\frac{x}{7} = \tan(22^\circ)$ $7 \tan(22^\circ) = x$ $x = 7 \tan(22^\circ)$ $x = 7(0.4040)$ $x = 2.8$</p> <p>$\begin{array}{r} 2 \ 2 \\ 0.4040 \\ \underline{x \ 7} \\ 2.8280 \end{array}$</p>
<p>10.</p> 	<p>11.</p> 	<p>12.</p> 
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