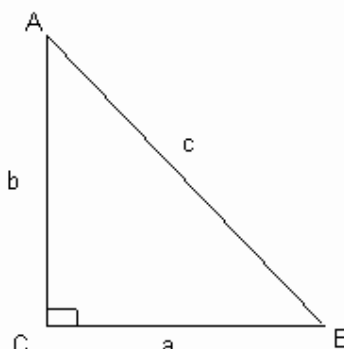




Common mistakes & How to avoid
X-Math

Unit: Trigonometry

Types of Question	Common Mistakes	Points to be emphasised
<p>Questions based on finding values of the trigonometric ratios given the angle or one of the six trigonometric ratios.</p>	<p>(i) Error in identifying the angle under consideration and the opposite side, adjacent side etc.</p>	<p>While using the trigonometric ratios, it is very important to specify the angle under consideration.</p>  <p>For example in a right angle triangle ABC, side c is always the hypotenuse.</p> <p>While working on angle B, b will be your opposite side and a will be the adjacent side.</p> <p>Similarly for angle A, a is the opposite side and b is adjacent one.</p>
<p>Questions on complementary angle relations</p>	<p>(i) Error while taking complementary angles For example in questions of the</p>	<p>(i) In questions of the form $\tan 58^\circ \tan 33^\circ \tan 32^\circ \tan 57^\circ = 1$ we need</p>



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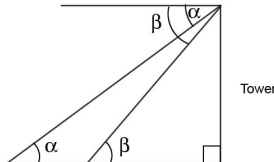
	<p> $\tan 58^\circ \tan 33^\circ \tan 32^\circ \tan 57^\circ = 1$ changing all four angles to complementary angles i.e. $\cot 32^\circ \tan 57^\circ \tan 58^\circ \tan 33^\circ = 1$ (ii) Error in applying the relation of complementary angles like $\cos(90^\circ - 30^\circ) = \cos 30^\circ$ (iii) Taking wrong values of standard trigonometric ratios at angles $30^\circ, 60^\circ, 45^\circ, 90^\circ$ </p>	<p> not help you go to answer The important approach here is to make the pairs of angles. $(\tan 58^\circ \tan 32^\circ)(\tan 33^\circ \tan 57^\circ)$ Now change one angle in each pair $(\cot(90-58^\circ) \tan 32^\circ)(\cot(90-33^\circ) \tan 57^\circ)$ And you will get $(\cot 32^\circ \tan 32^\circ)(\cot 57^\circ \tan 57^\circ)$ which is 1. </p> <p> If both sin and cos are given do not change both Change either sin or cos but more importantly see the angles, they should be complements of each other. </p> <p> (ii) Remember complementary relations $\cos \leftrightarrow \sin$ $\tan \leftrightarrow \cot$ $\operatorname{cosec} \leftrightarrow \sec$ Also keep in mind that $\cos(90^\circ - 30^\circ)$ is $\sin 30^\circ$ or $\cos 60^\circ$ </p> <p> (iii) Learn the values of standard ratios of $30^\circ, 60^\circ, 45^\circ, 90^\circ$ of sin and cosine. Rest others follow from these. Mostly in the questions where you need to find the values without trigonometric tables answer comes out to be a constant. Keep this in mind to cross check your answer. </p>
<p>Questions on Proving identities using standard identities</p>	<p> (i) Error in applying identities. (ii) Not able to comprehend how to arrive at the other </p>	<p> (i) Learn the basic identities. </p> <ul style="list-style-type: none"> • $\sin^2 \theta + \cos^2 \theta = 1$ • $1 + \tan^2 \theta = \sec^2 \theta$



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	<p>side</p> <p>(iii) Students at times apply identities incorrectly $\sin \theta = 1 - \cos \theta$ Or $\tan \theta = 1 + \sec \theta$.</p> <p>(iv) Starting the simplification of both sides simultaneously</p>	<ul style="list-style-type: none"> • $1 + \cot^2 \theta = \operatorname{cosec}^2 \theta$ <p>Each identity can be expressed in two other forms take care of signs while transposing.</p> <p>(ii) When solving problems you can either take the LHS or the RHS Observe and analyze which way it is easy to arrive at the other side Use techniques such as substitution, factorisation, rationalisation, create common denominators, accordingly to simplify and attain the other side.</p> <p>(iii) Also, remember that $\sin^n \theta + \cos^n \theta = 1$ holds only for $n=2$. and not for other values of same applies to the other 2 identities as well.</p> <p>(iv) Do not start simplifying both sides simultaneously start with one of the sides and arrive at the other side.</p>
<p>Questions based on heights and distances</p>	<p>(i) Error in comprehending the problem</p> <p>(ii) Incorrect diagram</p> <p>(iii) Not marking angle of depression in the diagram</p> <p>(iv) Error in identification of appropriate trigonometric ratios and the triangle.</p>	<p>(i) keep in mind that the angle formed by the line of sight with the horizontal when the object is above the horizontal level is called the angle of elevation.</p> <p>The angle formed by the line of sight with the horizontal when the object is below the horizontal level is called the angle of depression.</p>



	<p>(v) Not mentioning units in the answer</p> <p>(vi) error in calculations</p>	<p>depression.</p> <p>Always draw a figure of the problem given to you. A figure always carries 1-2 marks in the examination. It will also help in understanding the problem better.</p> <p>(ii) Your solution to the problem must match the labelling done by you in the figure. Keep in mind that angles nearer to a right angle are larger than the farther angles.</p> <p>(iii) Mark the angle of depression in the figure if the angle of depression is given as shown</p>  <p>(iv) Look at the quantities to be determined; it is height or length or distance, and then identify the triangle in the figure which contains that. Afterwards, look for the T ratio which will involve that side. Also keep in mind</p> <p>Whenever it is given that a flag staff is situated on the top of a building and it is required</p>
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		<p>to find the total height above the ground, then the height would also include the length of the flag staff.</p> <p>(v) Always put the units along with the final answer and highlight or underline the answer</p> <p>(vi) Be careful with the calculations</p>