Word problems using trigonometric ratios worksheet

The relationship of trigonometry to measurement places it in the learners' manuals for a wide range of professions. Carpenters, construction workers, designers, architects and engineers to name names, deal with measurements and as such are engaged in triangular measures or trigonometry. Combining your skills with similar triangles, trigonometry and pythagoras theorem, you are ready to deal with the problems associated with the more real scenarios. The situations you will consider will be specifically related to the right triangles and you will use our trigonometric functions. Once a chart is established, the mathematical solution will be the same as the one shown on Side Resolution or Solve Corners. There are two new words that may appear for application problems. Angle of relief: In this diagram, xº marks the angle of elevation at the top of the tree, as seen from a point on the ground. The angle of elevation is always measured from the ground up. The angle is up from a horizontal line. It's always in the triangle. You can think of the angle of elevation in terms of the movement of your eyes. You look straight ahead and you have to lift your (raised) eyes to see the top of a tree. When trying to remember the meaning of an angle at altitude, consider an elevator that only rises! Angle of depression: In this diagram, xº marks the angle of depression of the boat in the sea from the top of the lighthouse. The angle of depression is always outside the triangle. She's never in the triangle. The angle is from a horizontal line. You can think of the angle of depression in terms of the movement of your eyes. You stand at the top of the lighthouse and look straight ahead. You need to take off (depress) your eyes to see the boat in the water. Notice how the horizontal line in the diagram of the angle of depression is parallel to the ground level. The fact that horizontal lines are always parallel ensures that the alternative corners of the interior are equal in measure. In the diagram, the angle marked with the so-called is equal to m∠BAC. Simply put, it means that ... → the angle of elevation = the angle of depression ← When solving a problem with a depression angle, you need to find the angle measure inside the triangle. There are two options: Option 1: find the angle inside the triangle, which is adjacent (adjacent) to the corner of depression. This adjacent angle will always be the addition of the angle of depression, since the horizontal line and the vertical line are perpendicular (90º). In the diagram on the left, the adjacent angle is 52º. Option 2: use the fact that the angle of depression = the angle of elevation and the ∠BAC as 38º inside the triangle. Note that both options, the answer is the same. Let's see how to put these skills in the Problems. The nursery dedicates a new tree and attaches a man wire to help support the tree while its roots are held. An 8-foot wire is attached to the tree and a stake in the ground. From a stake in the ground, the angle of elevation of the connection to the tree is 42º. Find to the nearest tenth of the leg, the height of the point of connection of the tree. SOLUTION: The wire is the wire used to plant a newly planted tree, preventing bending or rooting during high winds. • The angle of elevation is from the ground up. • It is assumed that the tree is vertical, making it perpendicular to the ground. • This problem refers to the opposite and hypotensiosis, making it a logical problem. • From the top of a forest ranger fire tower sees his partner on the ground at an angle of depression of 40º. If the tower is 45 feet high, how far is the partner from the base of the tower to the nearest tenth of a foot? SOLUTION: • Remember that the angle of depression is from a horizontal line of vision downwards. • It is assumed that the tower is vertical, making it perpendicular to the ground. • This solution will use alternate inner angles from parallel horizontal lines, so place 40º in the triangle from the partner (bottom right). • This solution refers to opposite and adjacent and makes it a tangent problem. • Find the shadow that is poured from a 10-meter lamp when the angle of rise of the sun is 58°. Find the length to the nearest tenth of the leg. SOLUTION: • Remember that the elevation angle is from the horizontal line of the ground upwards. • It is assumed that the lamp is vertical, making it perpendicular to the ground. • Shadows are on the ground! If you put the shadow on the hypothenusis that you created on the phenomenon (ghost), not shadow! • This solution refers to opposite and adjacent and makes it a tangent problem. • Not all trigonometric problems with words will use the terms angle of elevation or angle of depression. You may need to read carefully to see where to point the corner in the problem. The ladder bends against a brick wall. The foot of the ladder is 2 meters from the wall. The ladder reaches a height of 5 feet on the wall. Find to the nearest degree, the corner of the ladder makes with the wall. SOLUTION: • In this problem a place where the ladder meets the wall. Do not assume that the angle will always be at ground level. • It is assumed that the wall is vertical, perpendicular to the ground. • The foot of the ladder is the lower part of the ladder, where it hits the ground. • This solution refers to opposite and adjacent and makes it a tangent problem. • The problem may consist of two overlapping triangles. A radio station is built in two sections. From a point 25 metres from the base of the the angle of elevation of the top of the first part is 25º and the angle of elevation of the upper part of the second part is 40º. To the nearest step, what is the height of the top of the tower? SOLUTION: • Blink for this problem as working with two separate triangles: (1) the larger triangle with a 40º angle and a vertical side, which represents the entire height, b, of the tower, and (2) the smaller triangle with a 25º angle and vertical side, but, which represents the height of the first (lower) part of the tower. • Decide on vertical heights (b and a) in the two separate triangles. • The required height, x, from the second (upper) part of the tower will be the difference between the entire height, b and the height of the first (lower) part, a. You will need to remove. • In both triangles, the solution deals with opposite and adjacent, making it a tangent problem. • Larger triangle height b: • Smaller triangle height a: • Difference (b - a): 73.00166791 - 40.56876626 = 32.43290165 ≈ 32 feet Note, in this problem trigonometric functions cannot work directly on the side with the inscription x, because this side is not a side of the right triangle. Be sure to set the graphics calculator to DEGREE mode. For help with a triangular ratio of your calculator, click here. NOTE: The republishing of materials (partially or in full) from this site on the Internet is a copyright infringement and is not considered fair use for educators. Please read the Terms of Use. Question 1:The angle of elevation at the top of the building at a distance of 50 m from its leg on a horizontal plane was found to be 60 degrees. Find the height of the building. Question 2: Ladder placed against a wall so that it reaches the top of the wall at a height of 6 m and the ladder is inclined at an angle of 60 degrees. Find out how far the ladder is from the foot of the wall. Question 3: A kite string is 100 meters long and makes an angle of 60° with a horizontal one. Find the height of the kite, assuming there is no cork in the low. Question 4: From the top of the tower 30 m in height, a person observes the base of a tree at an angle of depression measuring 30 degrees. Understand the distance between the tree and the tower. Question 5:Man wants to determine the height of light house. It measures the angle of A and finds a tan A = 3/4. What is the height of the bright house if A is 40 meters from the base? Question 6:He ladder leans against a vertical wall makes an angle of 20° with the ground. The foot of the ladder is 10 feet from the wall. Find the length of the ladder. Question 7: A kite flying at a height of 65 m is attached to a string of 31° to the horizontal. What is the length of a string? Question 8: The length of the thread between a kite and a point on the ground is 90 m. such that tan φ = 15/8, how high will the kite be ? Question 9:The plane is approaching the point of air. It is at a distance of 12 km from the observation point and makes an angle of elevation of 50 degrees. Find the height above the ground. Question 10: And the balloon is connected to a weather station by a cable with a length of 200 m oblique angle of 60 degrees . Find the height of the balloon from the ground. (Imagine that there is no stagnation in cable) Answer question 1: The angle of elevation at the top of the building at a distance of 50 meters from its leg on a horizontal plane is 60 degrees. Find the height of the building. Solution : Now we need to find the length of the side AB.tanά = opposite side/Adjacent sidetan 60° = AB/BC√3 = AB/50√3 x 50 = ABAB = 50√3Retestable value of √3 is 1.732AB = 50 (1.732 AB) = 86.6 MSoSo, The height of the building is 86.6 m. Question 2: Ladder placed against a wall, so that it reaches the top of the wall at a height of 6 m and the ladder is inclined at an angle of 60 degrees. Find out how far the ladder is from the foot of the wall. Solution : Here AB represents the height of the wall, BC represents the distance between the wall and the foot of the ladder and the AC represents the length of the ladder. In the right triangle ABC, the side that is opposite to an angle of 60 degrees is known as the opposite side (AB), the side that is opposite to 90 degrees, is called hypotensiosis side (AC) and the rest of the country is called neighboring country (BC). Now, we need to find the distance between the legs of the ladder and the wall. Тоест, ние трябва да се намери дължината на BC.tan θ = противоположната страна/Adjacent sidetan60° = AB/BC√3 = 6/BCBC = 6/√3BC = (6/√3) x (√3 /√ √3/√3/√3 BC = (6√3)/3BC = 2√3Разходната стойност на √3 е 1.732BC = 2 (1.732)BC = 3.464 m Така, Разстоянието между подножието на стълбата и стената е 3.464 m.Въпрос 3:Авицата на хвърчилото е дълга 100 метра и прави ъгъл от 60° с хоризонтален. Намерете височината на хвърчилото, ако предположим, че няма застой в низа. Решение : Сега трябва да намерим височината на страната AB. Sin θ = страни на обратната страна/хипотенузата= AB/ACin 60° = AB/100√3/2 = AB/100(√3/2) x 100 = ABAB = 50 √3 MSo, височината на хвърчилото от земята 50 √3 м.Въпрос 4:От върха на кулата 30 м височина човек наблюдава основата на едно дърво под ъгъл на депресии measuring 30 degrees. Understand the distance between the tree and the tower. Solution : Here AB represents the height of the tower, BC represents the distance between the tower step and the foot of the tree. Now we need to find the distance between the foot of the tower and the foot of the tree (BC.tan φ = Opposite side / Adjacent sidetan 30° = AB/BC1/√3 = 30 / BCBC = 30√3Serve value of √3 is 1.732BC 30 (1.732) BC = 81.96 mSo, the distance between the tree and the tower is 51.96 m.Question 5: One wants to determine the height of light house. It measures the angle of A and finds a tan A = 3/4. What is the height of the bright house if A is 40 meters from the base? Solution : Now we need to find the height of the lighthouse house (BC)tana = opposite side / adjacent sidetanA = BC / ABGiven : tanA = 3/43/4 = BC / 403 x 40 = BC x 4BC = (3 x 40) / 4BC = 3 x 10) BC = 30 m So, The height of the lighthouse house is 30 m.Question 6:A person wants to determine the height of light house. It Ladder leans on a vertical wall making an angle of 20° with the ground. The foot of the ladder is 10 feet from the wall. Find the length of the ladder. Solution: Now we need to find the length of the ladder (AC). Cos φ = adjacent side/lateral hypotension Which φ = BC/ACCos 20° = 3/AC0.9396 = 3/0.9396AC = 3.192Sier, The length of the ladder is 3.192 m.Question 7:A the kite, which flies at a height of 65 m, is attached to a string inclined 31° on the horizontal. What is the length of a string? Solution : Now we need to find the length of the string AC. Sin φ = opposite side/hypotenuse sideSin φ = AB / ACSin 31 ° = AB / AC0.5150 = 65/ACAC = 65/0.5150AC = 126.2 mHence, The length of the string is 126.2 m. Question 8: The length of a string between a kite and a point on the ground is 90 m. If the string makes an angle with the plane so that tan = 15/8, how high will the kite be? Solution : Now we need to find the length of the country AB. Tan φ = 15/8 --------> cot φ = 8/15cccccc = √(1+ cot²)φ)csc = √(1+ 64/225)csc φ = √(225 + 64)/225cscc φ = √289/225cscc π = 17/15 -------> blue = 15/17No, blue = Opposite side/hypotensified side = AB/AC/AC = 15/17AB/90 = 15/17AB = (15 x 90)/17AB = 79.41 tower height is 79.41 m.Question 9:One aircraft is observed approaching the air point. It is at a distance of 12 km from the observation point and makes an angle of elevation of 50 degrees. Find the height above the ground. Solution : Now we need to find the length of the side AB. From the figure given above, AB means the height of the plane above the ground. sin φ = opposite side/hypotensic sides 50° = AB/AC0.7660 = h/120.7660 x 12 = hh = 9.192 kmThis time, the plane's altitude above ground is 9.192 km. Question 10: And the balloon is connected to a weather station by a cable with a length of 200 m oblique angle of 60 degrees . Find the height of the balloon from the ground. (Imagine that there is no stagnation in cable) Solution : Now we need to find the length of the side AB. From the figure given above, AB is about the height of the balloon above the ground. sin φ = Opposite side sin = AB / ACin 60° = AB/200√3/2 = AB/200AB = (√3/2) x 200AB = 100√3 Application value of √3 is 1.732AB = 100 (1.732)AB = 173.2 mSo, Besides the things given in this section, if you need other things in mathematics, please use google custom search here. If you have any feedback on our mathematical content, please email us: v4formath@gmail.com always appreciate feedback. You can also visit the following web pages of different things in mathematics. 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