Sine and cosine rule worksheet doc

Ideal for gcse revision, this sheet contains exam type questions that gradually increase in difficulty. This sheet covers the Cosine Rule and covers both one- and two-stage problems. These reports are great for use in class or as homework. They are also excellent for teaching 1:1 and for interventions. For revision sheets of a similar style in other topics, click 👉 tes.com/../more... Answers are included, as is the new PowerPoint style, which allows you to select individual questions for an enlarged view on the screen. The answer can then be drawn up 'live' by the teacher (or student) or with one click revealing my solution. It not only helps in the classroom, but it is also very useful for the student who is reviewing them at home 😀. 👆So if you like this feed, consider it and/or leave a comment💬. If the rate-resource button on this page doesn't work, go to the rating page by clicking here ⭐ ⭐tes.com/.../rate-resources... Read moreFreeReport problem Grade 11 math trigonometry sheet tests sinus, cosine and area rules learned and determines whether students can apply to two-dimensional (2D) questions. The questions are based on the South African ceiling syllabus and there is a fully drafted memorandum. Download here: Worksheet 8: Trigonometric Worksheet 8 Memorandum: Trigonometry September 9, 2019 corbettmaths Click here for advanced trigonometry answers (1) Determine whether the following measurements produce one triangle, two triangles or no triangle: ∠B = 88°, and = 23, b = 2. Resolve if a solution exists. Solution(2) If the sides of the triangle are ABC a = 4, b = 6 and c = 8, then show that 4 cosB + 3cosC = 2. Solution(3) In the triangle ABC, if a = √3 − 1, b = √3 + 1 and C = 60°, locate the other side and the other two angles Solution(4) In each triangle ABC, prove that the area triangle = b2 + c2 − a2/4 cotA. Solution(5) In the triangle ABC, if a = 12 cm, b = 8 cm and C = 30°, then show that its area is 24 sq.cm. Solution(6) In the triangle ABC, if a = 18 cm, b = 24 cm and c = 30 cm, then show that its area is 216 sq.cm. Solution(7) Two soldiers A and B in two different underground bunkers on a flat road, at the site of an intruder at the top of the hill. The angle of altitude of the intruder from A and B to the ground level in the eastern direction is 30° and 45° respectively. If a B stands 5 km apart, find the distance of the intruder from B. Solution(8) The researcher wants to determine the width of the pond from east to west, which can not be done by actual measurement. From point P, it finds that the distance to the easternmost point of the pond is 8 km, while the distance to the westernmost point from P is 6 km. If the angle between the two lines of view is 60 °, find the width of the pond. Solution(9) Two naval helicopters A and B fly over the Bay of Bengal at the same altitude from sea level to search for the missing ship. The pilots of both helicopters see the ship at the same time while they are 10 km apart from each other If the distance of the ship from A is 6 km and if the track segment AB subtends 60° on the ship, find the distance of the ship from B. Solution(10) A direct tunnel is carried out over the mountain. The surveyor observes the two ends of the A and B tunnels to be built from point P in front of the mountain. If AP = 3 km, BP = 5 km and ∠APB = 120°, then find the length of the tunnel to be built Solution(11) Farmer wants to buy a triangular shape of the plot with sides of 120 feet and 60 feet and the angle included between the two sides is 60 ·. If the land costs Rs. 500 per sq.ft, find the amount needed to purchase the land. Also find the perimeter of the earth. Solution(12) A fighter jet must hit a small target by flying a horizontal distance. When the target is spotted, the pilot measures the depression angle at 30°. If after 100 km the target has a deep angle of 45°, how far is the target from the fighter at this point? Solution(13) An aircraft is 1 km from one landmark and 2 km from another. In terms of ground planes between them subtends an angle of 45 °. How far apart are the monuments? Solution(14) The man begins his morning walk at point A reaches two points B and C and finally back to A so that ∠A = 60 · and ∠B = 45 ·, AC = 4 km in the triangle ABC. Find the total distance he traveled during his morning walk. Solution (15) Two vehicles leave the same place P at the same time, moving on two different roads. One vehicle is travelling at an average speed of 60 km/h and the other vehicle is travelling at an average speed of 80 km/h. After half an hour, the vehicle reaches destinations A and B. If AB inserts $60,50,000 at the starting point P, find AB. Solution (16) Suppose that the satellite in space, the Earth station and the center of the Earth lie in the same plane. Let r be the radius of the Earth and R is the distance from the center of the Earth to the satellite. Let's leave the distance from earth station to satellite. Let 30° be the angle of altitude from earth station to satellite. If the segment of the line connecting the Earth station and satellite subtends angle α in the center of the earth , then demonstrate that d = R√1 + (r / R) 2 - 2 (r / R) cos α. Solution Unlike the thing mentioned above, if you need some other things in mathematics, please use our google custom search here. If you have any comments about our mathematical content, please write to us: v4formath@gmail.com We always appreciate your feedback. You can also visit the following websites about different things in mathematics. WORD PROBLEMSHCF and LCM word problemsSloval problems on simple equations Problems with Word text on linear equations Problems with word on quadratic equationsAlgebra problemsSloval problemsWord problems on swallow and circuit word problemsSlovy problems with direct variation and inverse variant word problems with unit priceScrewing problems with unit rate Word problems when comparing ratesAdaptable problems with word units on compound interestSloval problems on types of angles Complementary and complementary angles word problemsDouble facts word problemsTrigonometry word problems Percentage word problems Gain and loss word problems Markup and markdown word problems Decimal word problemsProblems on fractionsSloval problems on mixed fractrionsOne step equation word problemsLinear inequality word problemsRatio and share word problemsTime and work problems WordSloval problems On sets and Venn diagramsSlovals problems on agesPythagorean theorem word problemsProcent number of word problemsSlovals problems at constant speedSlovals problems average speed Word problems on sum of triangle angles is 180 degreesOthe other topics Gain and loss of abbreviationsPercentage shortcuttimes table abbreviationsTime, speed and distance abbreviationsRatio and proportional abbreviationsDomain and range of rational functionsDomains and range of rational functions with holesManage rational functionsProperiable functions with holesamiConsumage of repeating decimal places into fractionsMetting rational numbersDeceive to create a square root using the long divisionL.C.M method for solving time and work problemsSaying verbal problems into algebraic expressionsDeparable at 2 square 256 is 2. divided by 17Says when 17 power 23 is divided by 16Sum of all three digit numbers divisible by 6Sum of all three numbers divisible by 7Sum from all three numbers divisible by 8Sum from all three digit numbers created using 1, 3, 4Sum all three four-digit numbers created with non-zero digitsSum of all three four-digit numbers created using 0 , 1, 2, 3Sum all three four-digit numbers created using 1, 2, 5 , 6 copyright onlinemath4all.com SBI! Level 6-7 Looking at the triangle below, the sine rule is: \dfrac{\textcolor{limegreen}{a}}}{\sin\textcolor{limegreen}{A}}=\dfrac{\textcolor{blue}{b}}{\sin \textcolor{blue}{B}}=\dfrac{\textcolor{{red}{c}{sin\textcolor{red}{C}} In this topic, we'll go over examples of how to use the sinus rule to find missing angles and missing sides. Using the sine rule, find the length of the side marked x to 3 s.f. [2 markers] First we need to compare the letters in the formula with the sides we want here: a = x, A = 21\ degree, b = 23 and B = 35\ degree Next, we are ready to replace the values into the formula. This gives us: \dfrac{x}{\sin(21°)}=\dfrac{23}{\sin(35°)} Multiplying both sides \sin(21°): x=\dfrac{23}{\sin(35°)}\times\sin(21°) By inserting this calculator into the calculator, we get: x=14.37029543... x=14.4 (3 sf) As in previous topics, it is not necessary to evaluate the sine functions until the last step. Use the sinit rule to find the blunt angle marked x to 2 s.f. [2 tags] As we were asked to find the missing angle, we can use a different version of the sine rule: \dfrac{\sin A}{a}=\dfrac{\sin B}{b}=\dfrac{\sin C}{c} A=x, a=43, B=33\degree, b=25. Replacing these values in the formula, we get: \dfrac{\sin x}{43}=\dfrac{\sin(33°)}{25} Multiply both sides 43 get: \sin Then, taking \sin ^{-1} from both sides, we get: x = \sin ^{-1}\bigg(\dfrac{43\sin(33°)}{25}\bigg) x=69.5175049...° However, the question asked at a blunt angle, but we have an acute answer - why? This is because we can draw two different (but both correct) triangles using the information we got at the beginning. This is an ambiguous case of the sinus rule and occurs when you have two sides and an angle that does not lie between them. To find a blunt angle, simply retract the sharp angle from 180: 180-69.5175049=110.4824951 x = 110\degree (2 sf) First we need to find the angle opposite to the missing side, because it is not given in question. Using all angles in the triangle to add to 180 degrees we get, that: A = 180\ degree-40\degree-94\degree=46\degree Now we have enough information to correctly mark the triangle and replace the values in the sine rule: \dfrac{x}{\sin(46\degree)}}=\dfrac{10.5}{\sin (94\degree)} Solution for x we get: x=\dfrac{10.5}{\sin(94\degree)}\times\sin(46\degree)=7.571511726... x=7.57 (3 sf). Here we are able to apply the sine rule immediately: \dfrac{x}{\sin(30\degree)}=\dfrac{5}{\sin(80\degree)} Multiplying both sides equation by \sin(30\degree): x=\dfrac{5}{\sin(80\degree)}\times\sin(30\degree)=2.538566... x=2.54 cm (3 sf). Here we are able to apply the sine rule immediately: \dfrac{\sin(x\degree)}{12}=\dfrac{\sin(15\degree)}{7} Multiplying both sides of equation 12 to find: \sin(x)=\dfrac{12\times\sin(1 5 \degree)}{7}=0.4436897916 Taking the inverse sine of both sides: x =\sin^{-1}(0.4436897916)=26.33954244\degree However, relative to the diagram, angle is clearly blunt (greater than 90 degrees). This is an ambiguous case of the sinus rule and occurs when you have 2 sides and an angle that does not lie between them. To find a blunt angle, simply retract the sharp angle from 180:180\degree-26.33954244\degree =153.6604576 =154\degree (3 sf). Instead of entering an integer into the calculator for each calculation step, you can use the ANS button to save time. We are able to apply the sine rule immediately: \dfrac{\sin(x\degree)}{6.5}=\dfrac{\sin(52\degree)}{12} Multiplying both sides of the equation to 6.5 to determine that: \\sin(x)=6.5\times \dfrac{\sin(52\degree)}{12} =0.4268391582 Taking the inverse sinus of both sides and maintaining the response from the previous step on our calculator, x=\sin^{-1}(ANS)=25.26713177 x=25.3\degree (3 sf). To apply the sine rule: \dfrac{x}{\sin(35\degree)}=\dfrac{6}{\sin(68\degree)} Multiplying both sides of the equation \sin(35\degree) to find: x=\dfrac{6}{\sin(68\degree)}\times\sin(35\degree)=3.71732685... x=3.71 cm (3 sf). Page 2 level 6-7 For 3D Pythagoras, there is a new equation we can use that just uses Pythagoras' theore twice. In the diagram that appears, find the length \textcolor{red}{d} [3 tags] We already know that Equation 1: \textcolor{limegreen}{a}^2 + \textcolor{orange}{b}^2 = \textcolor{black}{e}^2 and we see that edc also forms the right triangle, so we know Equation 2: \textcolor{black}{e}^2 + \textcolor{blue}{c}^2 =\textcolor{red}{d}^2 So that means we can combine equation 1 and 2 to give the 3D Pythagoras equation. \textcolor{limegreen}{a}^2 + \textcolor{orange}{b}^2 +\textcolor{blue}{c}^2 =\textcolor{red}{d}^2 With 3D trigonometry is no trick, you need to solve each section in steps, which makes it a harder topic. Example: Shape ABCDEFG is a box. [3 brands] Find the length of the side FC, marked in red, at 3 sf. First, the shape is a blocks, which means that each corner is a right angle. First, what we need to do is find FH, it will give us the base of the rectangular triangle FHC, which will allow us to find fc. To find the lateral length of FH, we need to use trigonometry Adjacent FE=9\text{ cm} Hypotenuse =x That is, that we will use 'CAH' \cos(26) = \dfrac{\text{Adjacent}}{\text{Hypotenuse}} = \dfrac{9}{FH} FH \times \cos(26) = 9 FH = 9 \div \cos(26) = 10.013... cm Now we know FH, our first triangle, FCH, looks like this: Now we know the two lateral lengths of this triangle, we can use Pythagoras' theorus to find the third , FC, which is the answer to the whole question. (FC)^2 = 5^2 + (10.013...) ^2 FC = \sqrt{5^{2} + (10.013...) ^{2}} = 11.2 cm (3 sf). If we draw a line from the top to E to the center of the base, then this line represents a perpendicular height, because we know that the vertex is directly above the center. Consider the triangle formed by this line, the line that leads from the center to the C, and the EC line. We know the buck, but we need more information. Here we observe the distance from the center to C is half the distance from A to C. Since we know the width of the square triangle, we can find the length of the AC, half, and then use the result as part of the Pythagorean theorm to find the perpendicular height. To find the AC, consider the ABC triangle. Therefore, the distance from the center of the base to C 5\sqrt{2}. Finally, we reconsider the first triangle, which we now know has a base of 5\sqrt{2} cm, and calculate the perpendicular height. 12^2 = (\text{HEIGHT})^2 + (5\sqrt{2})^2 (\text{HEIGHT})^2 = 12^2 - (5\sqrt{2})^2 = 144 - 50 = 94 \text{HEIGHT } = \sqrt{94} cm. Here we use 3D Pythagoras to find that AY is AY ^ 2 = 9 ^ 2 + 6 ^ 2 + 6 ^ 2 AY =\sqrt{81+36+36}=\sqrt{153}=3\sqrt{17} cm. Here we use 3D Pythagoras to find out that CE is CE ^ 2 = 9 ^ 2 + 6 ^ 2 + 12 ^ 2 CE =\sqrt{81+36+144}=\sqrt{261}=3\sqrt{29} cm. First, we can determine the length of db pythagoras or by recognizing that the diagonal of the square is \sqrt{2} \times \text{ side length}, ie: DB= 14\ sqrt{2} Therefore, the length from D to the center of the square, O, half this value DO = 7\ sqrt{2} Now we have enough information to find the desired angle , \tan(EDB) = \dfrac{O}{A} = \dfrac{11}{7\sqrt{2}}= \text{Angle} \ , EDB = tan^{-1} \bigg(\dfrac{11}{7\sqrt{2}} \bigg)=48.0\degree \bigg)=48.0\degree