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Proving triangles similar worksheet

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Congruent and similar triangles work with similar triangles, determining similar triangles Show step-by-step Solutions Try the free Mathway calculator and problem solver below to practice various math topics. Try the given examples, or type in your own problem and check your answer with the step-by-step explanations. We welcome your feedback, comments and questions about this website or page. Please submit your feedback or inquiries via our Feedback page. Related topics: More lessons for Grade 8 Maths Worksheets Examples, solutions, videos, worksheets, stories and lessons to help Grade 8 students learn how to determine if two triangles are similar. Triangle Agreement - AA SSS SAS & AAA Postulates Prove Similar Triangles, Two Column Evidence How to use two column evidence to prove whether two triangles are similar using the mostly the AA postulate. Other triangle agreement postulates mentioned are the AAA, SSS, and SAS postulates. Statements used in this video include the base angle theorem, statements related to parallel lines, alternate inner-corner theorem, vertical angles, reflexive property, definition of a height, right angle congruence and more. Similar Triangle Evidence Students learn that if two corners of one triangle are consistent with two corners of another triangle, then the triangles are similar (Angle Agreement postulate, or AA Agreement Postulate). Students also learn that the scale factor ratio is of the lengths of two corresponding sides. Students are then asked to use these concepts to determine if given triangles are similar, and to find the missing side lengths in similar triangles. Show step-by-step Solutions Prove Triangles are Similar students learn the following statements related to similar triangles. Similar Triangles in Right Triangles If a height is drawn from the right angle in a right triangle, then similar triangles are formed, also as of the AA shortcut. Show step-by-step Solutions Try the free Mathway calculator and problem solver below to practice multiple maths Try the given examples, or type in your own problem and check your answer with the step-by-step explanations. We welcome your feedback, comments and questions about this website or page. Please submit your feedback or inquiries via our Feedback page. Problem 1 : In the triangles LMN and RST, $RS/LM = ST/MN = TR/NL$. Prove: $\triangle RST \sim \triangle LMN$. Problem 2 : Which of the following triangles are similar? Problem 3 : In the diagram shown below, use the given lengths to prove that $\triangle RST \sim \triangle PSQ$. Problem 4 : Determine whether the two triangles shown below are similar. Justify your answer. Problem 5 : If we move the detection pin of a pantograph next to a figure, the pencil attached to the end draws an enlargement. As the pantograph expands and contracts, the three brads and the detection pin always form the vertices of a parallelogram. The ratio from PR to PT is always equal to the ratio from PQ to PS. Also the suction cup, the detection pin, and the pencil remains collar. A. How can we prove that $\triangle PRQ \sim \triangle PTS$? In the diagram, PR is 10 inches and RT is 10 inches. The length of the cat RQ, in the original print is 2.4 inches. Find the length TS in the enlargement. Problem 6 : To measure the width of a river, we use a survey technique, as shown in the diagram. Use the given lengths (measured in feet) to find RQ. Detailed Answer Key Problem 1 : In the triangles LMN and RST, $RS/LM = ST/MN = TR/NL$. Prove: $\triangle RST \sim \triangle LMN$. Solution : Start by chart $\triangle LMN$ and $\triangle RST$. Find P on RS so that PS = LM. Sign PQ allowing PQ \parallel RT. Then $\triangle RST \sim \triangle PSQ$, through the Angle-Angle (AA) Agreement Postulate, and $RS/PS = ST/SQ = TR/PT$. Because PS = LM, we can replace in the given ratio and find that $SQ = MN$ and $QP = NL$. By using the SSS Congruence Statement, it follows that $\triangle PSQ \cong \triangle LMN$. Finally, uses the definition of congruent triangles and the AA Similarity Postulate to conclude that $\triangle RST \sim \triangle LMN$. Problem 2 : Which of the following triangles are similar? Solution : To decide which, if any, of the triangles is similar, we should consider the ratios of the lengths of corresponding sides. Ratios of side lengths of $\triangle ABC$ and $\triangle DEF$: $AB/DE = 6/4 = 3/2$; $CA/FD = 12/8 = 3/2$; $BC/EF = 9/6 = 3/2$. Because all the relationships are equal, $\triangle ABC \sim \triangle DEF$. Ratios of side lengths of $\triangle ABC$ and $\triangle GHJ$: $AB/GH = 6/6 = 1$; $AC/HJ = 12/14 = 6/7$; $BC/HJ = 9/10$. Because the relationships are not equal, $\triangle ABC$ and $\triangle GHJ$ are not similar. Since $\triangle ABC$ is similar to $\triangle DEF$ and $\triangle ABC$ is not similar to $\triangle GHJ$, $\triangle DEF$ is not similar to $\triangle GHJ$. Problem 3 : In the diagram shown below, use the given lengths to prove that $\triangle RST \sim \triangle PSQ$. Solution : Given : SP = 4, PR = 12, SQ = 5, QT = 15. Prove : $\triangle RST \sim \triangle PSQ$. Use the SAS Agreement Theorem. Start by comparing the lengths of the corresponding sides. $SR/SP = (SP + PR)/SP = (4 + 12)/4 = 16/4 = 4$; $RT/PT = PR/PT = 12/4 = 3$; $TS/SQ = (SQ + QT)/SQ = (5 + 15)/5 = 20/5 = 4$. So, the lengths of the sides SR and ST are proportional at the lengths of the corresponding sides of $\triangle PSQ$. Because $\angle C$ is included in both use the SAS Agreement Statement to conclude $\triangle RST \sim \triangle PSQ$. Problem 4 : Determine whether the two triangles shown below are similar. Justify your answer. Solution : By the AA Triangle Sum Statement, in $\triangle ABC$, $\angle A + \angle B + \angle C = 180^\circ$; in $\triangle DEF$, $\angle D + \angle E + \angle F = 180^\circ$. Deducting 126° from both sides, $\angle C = 54^\circ$. In triangles ABC and DEF, we have $\angle A = \angle D = 21^\circ$; $\angle E = \angle C = 54^\circ$. Two corners from one triangle are comparable to two corners of another triangle. By Angle-Angle (AA) Agreement Postulate, the triangles ABC and DEF are similar triangles. Problem 5 : If we move the detection pin of a pantograph next to a figure, the pencil attached to the end draws an enlargement. As the pantograph expands and contracts, the three brads and the detection pin always form the vertices of a parallelogram. The ratio from PR to PT is always equal to the ratio from PQ to PS. Also the suction cup, the detection pin, and the pencil remains collar. A. How can we prove that $\triangle PRQ \sim \triangle PTS$? In the diagram, PR is 10 inches and RT is 10 inches. The length of the cat RQ, in the original print is 2.4 inches. Find the length TS in the enlargement. Solution (a) : We know that $PR/PT = PQ/PS$. Because $\angle P \cong \angle P$, we can apply the SAS Agreement theory to conclude that $\triangle PRQ \sim \triangle PTS$. Solution (b) : Because the triangles are similar, we can set up a relationship to find the length of the cat in the enlarged drawing. Write Ratio : $PR/PT = RQ/TS$. Substitute. $10/20 = 2.4/TS$. Solve for TS. $TS = 4.8$. Hence, the length of the cat in the enlarged drawing is 4.8 inches. Problem 6 : To measure the width of a river, we use a survey technique, as shown in the diagram. Use the given lengths (measured in feet) to find RQ. Workaround : By the AA Agreement Postulate, $\triangle PQR \sim \triangle STR$. Write relationship. $RQ/RT = PQ/ST$. Substitute. $RQ/12 = 63/9$. Simplify. $RQ/12 = 7$. Multiply each side by 12. $12 \cdot (RQ/12) = 7 \cdot 12$. Hence, the river is 84 feet wide. To learn how to prove that two triangles are similar, please click here Apart of the stuff given above, if you need any other things in maths, please use our Google custom search here. If you have any feedback on our maths content, please post us : v4formath@gmail.com we always appreciate your feedback. You can also visit the following web pages on different things in maths. WORD TROUBLEHCF and LCM word problemsWord problems On simple comparisons Become problems on linear equations Word problems on quadratic comparisonsAlgebra word problemsWord problems on trainsArea and perimeter word problemsWord problems on direct variation and Reverse variation Word problems on unit priceWord problems on unit rate Word problems compared to ratesConverting customary units word problems Conversion metric units word problemsWord problems on simple interestWord problems on compound interestWord problems anglesSupplemental and complementary angles word problemsDouble facts word problemsTrigonometry word problemsPercentage word problemsProfit and loss word problemsRemarks and markdown word problemsWord problems on fractionsWord problems on mixed fractionsOne step comparison word problemsLinear inequalities word problemsRatio and relationship word problemsTime and work word problemsWord problems on sets and venn diagramsWord problems on agesPythagorean statement word problemsPercent of a number of word problemsWord problems on constant speedWord problems on average speedWord problems at sum from the corners of a triangle are 180 degreeOTHER TOPICS Gain and loss shortcutsPercentage shortcutsTimes table shortcutsTime , speed and distance shortcutsRatio and ratio shortcutsDomain and range rational functionsDomain and range rational features with holesUsing rational features Using rational features with gateConverting repeated decimals in fractionsDecimal representation of rational numbersFinding squares root using long sectionLCM method to solve time and work problemsTranslating the word problems in algebraic expressionsRemainder when 2 force 256 is divided by 17Remainder when 17 force 23 is divided by 16Sum of all three digit numbers divided by 6Sum of all three digit numbers associated with 7Sum of all three digit numbers formed by 8Sum of all three digit numbers using 1, 3, 4Sum of all three digit numbers formed using 1, 2, 3Sum of all three digit numbers formed using 1, 2, 5, 6 copyright onlinemath4all.com SBI! 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