Similar triangles practice worksheet pdf

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Check for Similar Triangles Each 8th grade worksheet of this compilation comprises eight triangle pairs with indicated side lengths. Determine whether the triangles are similar by checking if their corresponding sides are proportional and label them. Scale Factor of Similar Triangles Determine the scale factor by finding the corresponding sides and writing their ratio. Find the scale factor of the bigger to the smaller triangle or vice versa in Part A and in Part B find both the scale factors. Find the Sides of the Triangles using the Scale Factor Offered in this set of pdf worksheets are the scale factors and side lengths of one of the similar triangles. Equate the ratio of the sides with the corresponding scale factors to determine the side lengths of the triangles. Write the Similarity Statement | Level 1 Compare the similar triangles and complete the similarity statements, using the SSS criterion. Identify the proportional pairs of sides and rearrange the vertices based on the triangle given in the statement. Write the Similarity Statement | Level 2 Bolster skills in writing the similarity statement with these printable worksheets. Figure out the proportional sides of the rotated similar triangles using the scale factor and name the triangles accordingly. Similar Triangles | SSS, SAS and AA | Type 1 Observe the triangle pairs and based on the proportionality of their sides and congruence of their angles, identify the similarity postulates SSS, SAS, or AA and complete the similarity statements. Similar Triangles | SSS, SAS and AA | Type 2 The triangles in this batch of similarity worksheets are either overlapped or combined. Decompose the triangles and identify the similarity criterion to complete the similarity statement in this array of high school worksheets. Similar Triangles | Find the Sides | Type 1 Form an equation using the SSS criterion. Equate the ratios of two proportional pairs of sides in Part A and three proportional pairs of sides in Part B to find the missing lengths and sum up the side lengths to find the perimeter in Part C. Similar Triangles | Find the Sides | Type 2 Level up with this bundle of worksheets featuring overlapping similar triangles. Analyze the flips and rotations, decompose the triangles and find their scale factor to figure out the indicated length(s). Algebra in Similar Triangles | Solve for 'x' | Type 2 The similar triangles in this set of printable PDFs have common sides and vertices and involve side lengths presented as linear equations. Equate the ratios of the corresponding sides of the two triangles and simplify the equation to solve for 'x'. Right Triangle Similarity Conceptualize the right triangle similarity theorem with this collection of high school similar triangles worksheets. Write the similarity ratio of the right triangles using the known values to find the indicated length(s). Math worksheets and visual curriculum Home » Geometry » Similar Triangles Worksheets 1. Determine whether the two triangles given below are similar. Justify your answer. 2. Determine whether the two triangles given below are similar. Justify your answer. 3. For what value of x, is triangle ABC similar to triangle DEF? 4. Find the value of h in the diagram given below. 5. In the diagram given below, if AC and DE are parallel, find the value of h. Answers 1. Answer :By Triangle Sum Theorem, in Δ ABC,∠A + ∠B + ∠C = 180°21° + 105° + ∠C = 180°126° + ∠C = 180°Subtract 126° from both sides.∠C = 54°In triangles ABC and DEF, we have∠A = ∠F = 21°∠E = ∠C = 54°Two angles of one triangle are congruent to two angles of another triangle.By Third Angle Theorem, the third pair of angles must also be congruent.∠B = ∠D = 105°So, the triangles ABC and DEF are similar triangles.2. Answer :By Triangle Sum Theorem, in Δ ABC,∠A + ∠B + ∠C = 180°60° + ∠B + 79° = 180°∠B + 139° = 180°Subtract 139° from both sides.∠B = 41°By Triangle Sum Theorem, in Δ DEF,∠D + ∠E + ∠F = 180°60° + 42° + ∠F = 180°102° + ∠F = 180°Subtract 102° from both sides.∠F = 78°In triangles ABC and DEF, we have∠A = ∠D = 60°And no more pairs of angles are not congruent.So, the triangles ABC and DEF are not similar triangles.3. Answer :Let us assume the given two triangles are similar.So, the ratio of the corresponding sides must be equal.By taking the vertices of the triangle in the order (given) ABC and DEF, we haveAB/DE = BC/EF36/x = 30/15Take reciprocal on both sides.x/36 = 15/30x/36 = 1/2Multiply both sides by 36.x = (1/2) · 36x = 184. Answer :In the diagram given, we can consider two triangles ABC and ADE.In triangles ABC and ADE, we have∠B and ∠D are right angles∠A is common angleTwo angles of one triangle are congruent to two angles of another triangle.By Third Angle Theorem, the third pair of angles must also be congruent. So, the triangles ABC and ADE are similar triangles. In similar triangles, the ratio of the corresponding sides are equal.AB/AD = BC/DE ----(1)Find the length of AD :AD = AB + BDAD = 6 + 12AD = 18Substitute AB = 6, AD = 18, BC = 0.9 and DE = h in (1).(1)----> 6/18 = 0.9/hTake reciprocal on both sides.18/6 = h/0.93 = h/0.9Multiply both sides by 0.93 · 0.9 = h2.7 = h5. Answer :In the given diagram, we can consider two triangles ABC and DBE.Given : AC and DE are parallel.The parallel sides AC and DE are cut by the transversal EC.Then ∠E and ∠C are corresponding angles.When two parallel lines cut by a transversal, the corresponding angles are congruent.So, ∠E and ∠C are congruent.In triangles ABC and DBE, we have∠E ≅ ∠C∠B is common angleTwo angles of one triangle are congruent to two angles of another triangle.By Third Angle Theorem, the third pair of angles must also be congruent.So, the triangles ABC and DBE are similar triangles.In similar triangles, the ratio of the corresponding sides are equal.AB/DB = BC/BESubstitute AB = h, DB = 6, BE = 16 and BC = 56.h/6 = 56/16Multiply both sides by 6.h = (56/16) · 6 h = 21 Kindly mail your feedback to v4formath@gmail.comWe always appreciate your feedback. ©All rights reserved. onlinemath4all.com Question 1. ABC is an isosceles triangle, right -angled at C. Prove that $AB^2 = 2BC^2$. Solution Now Since it is an isosceles triangle AC=BC -(1) Now from Pythagorean theorem $AB^2 = AC^2 + BC^2$ From $AB^2 = 2BC^2$ Question 2. The areas of two similar triangles ABC and PQR are in the ratio 9 : 16. If BC = 4.5 cm, find the length of QR. Solution We know that $\frac {ar(\Delta ABC)}{ar(\Delta PQR)}=\frac {BC^2}{QR^2}$ $\frac {9}{16} = \frac {4.5^2}{QR^2}$ $QR= 6 cm$ Question 3. The foot of a ladder is 6 m away from a wall and its top reaches a window 8 m above the ground. If the ladder is shifted in such a way that its foot is 8 m away from the wall, to what height does its tip reach? Solution First case is depicted in the figure (a) Now from Pythagoras theorem $AC^2 = AB^2 + BC^2$ $AC^2 = 8^2 + 6^2 =100$ $AC=10$ cm This is the length of the ladder. Now Second case is depicted in figure (b) AC=10 cm BC=8 cm Now from Pythagoras theorem $AC^2 = AB^2 + BC^2$ $AB^2 = AC^2 - BC^2=10^2 - 8^2 =36$ $AB=6$ cm Question 4. Determine whether the triangle having sides $(b - 1)$ cm, $2\sqrt {b}$ cm and $(b + 1)$ cm is a right angled triangle. Solution These are sides of the Right angle triangle $(b+1)^2 = (2\sqrt {b})^2 + (b-1)^2$ $(b+1)^2 = 4b + b^2 +1 -2b$ $(b+1)^2=b^2 + 1 +2 b$ $(b+1)^2 = (b+1)^2$ Question 5. The areas of two similar triangles are 121 cm2 and 64 cm2 respectively. If the median of the first triangle is 12.1 cm, find the corresponding median of the other. Solution We know that $\frac {ar(\Delta 1)}{ar(\Delta 2)}=\frac {M_1^2}{M_2^2}$ $\frac {121}{64} = \frac {12.1^2}{QR}$ $QR= 8.8 cm$ Question 6. In $ \Delta ABC$, AD is perpendicular to BC. Prove that: a. $AB^2+ CD^2 = AC^2 + BD^2$ b. $AB^2 - BD^2 = AC^2 - CD^2$ Solution In $ \Delta ABC$, AD is perpendicular to BC Now $ \Delta ABD$ is an right -angle triangle So from Pythagoras theorem $AB^2 = AD^2 + BD^2$ $AD^2 = AB^2 - BD^2$ -(1) Similarly $ \Delta ADC$ is an right -angle triangle So from Pythagoras theorem $AC^2 = AD^2 + CD^2$ $AD^2 = AC^2 - CD^2$ --(2) From (1) and (2) $AB^2 - BD^2 = AC^2 - CD^2$ Which proved part (b) Now rearranging, $AB^2+ CD^2 = AC^2 + BD^2$ Which proved part (a) Question 7. In a quadrilateral ABCD, given that $\angle A + \angle D = 90^0$. Prove that $AC^2 + BD^2 = AD^2 + BC^2$ Solution ABCD is a quadrilateral as shown below. Extending the side CD and AB to meet at point P Now in ΔAPD $\angle A + \angle D + \angle C =180$ Now $\angle A + \angle D = 90^0$ Therefore $\angle C=90$ Now in right angle triangle APC $AC^2 = AP^2 + PC^2$ Now in right angle triangle BPD $BD^2 = BP^2 + DP^2$ Adding both $AC^2 + BD^2 =AP^2 + PC^2 + BP^2 + DP^2$ -(1) Now in right angle triangle APD $AD^2 = AP^2 + DP^2$ Now in right angle triangle BCP $BC^2 = CP^2 + BP^2$ Adding both $AD^2 + BC^2 = AP^2 + PC^2 + BP^2 + DP^2$ -(2) From (1) and (2) $AC^2 + BD^2 = AD^2 + BC^2$ Question 8.Prove that a line drawn through the mid- point of one side of a triangle parallel to another side bisects the third side. Question 9. Prove that the line joining the mid – points of any two sides of a triangle is parallel to the third side Question 10. Sides of triangles are given below. Determine which of them are right triangles.In case of a right triangle, write the length of its hypotenuse. (i) 7 cm, 24 cm, 25 cm (ii) 3 cm,4 cm,5 cm (iii) 40 cm, 80 cm, 100 cm (iv) 13 cm, 12 cm, 5 cm Solution i. $25^2 = 7^2 + 24^2$ Hence right angle triangle with 25 cm as hypotenuse ii. $5^2 = 3^2 + 4^2$ Hence right angle triangle with 5 cm as hypotenuse iii. $100^2 = 40^2 + 80^2$ Hence right angle triangle with 100 cm as hypotenuse iv. $13^2 = 12^2 + 5^2$ Hence right angle triangle with 13 cm as hypotenuse Question 11. DEF is an equilateral triangle of side $2b$. Find each of its altitudes. Solution In right angle triangle DNF $DF^2 = DN^2 + NF^2$ $DN^2 = DF^2 - NF^2$ $DN^2 = 4b^2 - b^2$ $DN =b \sqrt {3}$ Question 12. Triangle ABC is right- angled at B and D is the mid - point of BC. Prove that: $AC^2 = 4AD^2 - 3AB^2$ Solution In right angle triangle ABC $AC^2 = AB^2 + BC^2$ --(1) In right triangle ABD $AD^2 = AB^2 + BD^2$ $AD^2 =AB^2 + \frac {BC^2}{4}$ $BC^2 = 4AD^2 - 4 AB^2$ Substituting this in equation (1) $AC^2 = 4AD^2 - 3AB^2$ Question 13. The sides of a triangle ABC are in the ratio AB : BC : CA = 1 : √2: 1. Show that ABC is a right triangle, right -angled at A. Solution AB : BC : CA = 1 : √2: 1 $AB=x$ $BC= x\sqrt {2}$ $CA=x$ Now $BC^2 = AB^2 + AC^2$ $2x^2 = x^2 +x^2$ $2x^2=2x^2$ So ABC is right -angled at A Question 14. A vertical pole of length 6 m casts a shadow 4 m long on the ground and at the same time a tower casts a shadow 28 m long. Find the height of the tower Solution Given AB = 6m BC= 4 m Let Height of tower (DE)=h m EF = 28 m In ΔABC and $\Delta DEF $ $\angle C = \angle F$ (Same angle of elevation of Sun) $ \angle B = \angle E = 90$ By AA similarity criterion $\Delta ABC \sim \Delta DEF$ $\frac {AB}{DE}=\frac {BC}{EF}$ $ h=42 m$ link to this page by copying the following textClass 10 Maths Worksheet for Similar triangles Also Read Go back to Class 10 Main Page using below links Class 10 Maths Class 10 Science Practice Question Latest Articles Synthetic Fibres and Plastics Class 8 Practice questions Class 8 science chapter 5 extra questions and Answers Mass Calculator 3 Fraction calculator Garbage in Garbage out Extra Questions7

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