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# What is the perimeter of triangle formula

Instructor: Malcolm M.Malcolm has a Master's Degree in education and holds four teaching certificates. He has been a public school teacher for 27 years, including 15 years as a mathematics teacher. Video Definitions Formula Examples Challenge Perhaps one of the easiest ways to work with polygons is to find their perimeter, or the distance around their sides. The triangle is the simplest polygon, so finding its perimeter is simple! What is a Perimeter? Perimeter is the distance around the sides of a polygon or other shape. Perimeter is always the same linear measurement unit as the unit used for the sides. In the equilateral triangle below,  $\triangle WUT$  has sides  $WU$ ,  $UT$ , and  $TW$ . The little tick marks on the sides indicate that all three sides are the same, so the measurement for  $WU$ , 27 meters, is also true for the other two sides. [insert equilateral  $\triangle WUT$  as described] To find the perimeter of the triangle, add up the lengths of the three sides:  $P = 27 + 27 + 27$   $P = 81$  meters Triangle Classifications A triangle is a three-sided, flat shape that closes in a space. The three sides form three interior angles. Triangles come in many configurations, depending on your choice to focus on their sides or their angles: By Sides Equilateral -- Three equal-length sides Isosceles -- Two equal-length sides, called legs Scalene -- No equal-length sides By Angles Acute -- Three interior angles  $< 90^\circ$  Obtuse -- One interior angle  $> 90^\circ$  Right -- One interior angle =  $90^\circ$  Acute and obtuse triangles are in a category called oblique triangles, which means they have no right angles. Formula for Perimeter of a Triangle You can find the perimeter of every one of these triangles using this formula: This is always true where  $P$  is perimeter and  $a$ ,  $b$ , and  $c$  are the lengths of the sides. Perimeter of Equilateral Triangles Only with equilateral triangles can you substitute multiplication for addition. Since equilateral triangles have three equal sides,  $P = 3 \times a$ , or  $P = 3a$ , where  $P$  is perimeter and  $a$  is the length of any side. How to Find the Perimeter of a Triangle Here is scalene triangle  $DOT$  with measured sides of 9 yards, 11 yards, and 13 yards: [insert  $\triangle DOT$  as described] Add up the three lengths:  $P = 9 + 11 + 13$   $P = 33$  yards Here is isosceles triangle  $LEG$ , with base  $EG$  measuring 175 mm. Only one leg is measured,  $LE = 200$  mm. [insert  $\triangle LEG$  as described] How long is side  $GL$ ? They didn't tell you how long  $GL$  was! Think. It'll be all right. In an isosceles triangle, the other leg is equal to the identified leg, so you also know  $GL = 200$  mm! Add up the sides:  $P = 175 + 200 + 200$   $P = 575$  mm Some textbooks and mathematics teachers can take a simple concept like perimeter of triangles and turn it into a challenge. Here is  $\triangle YAK$  with a given perimeter of 118 km (yes, it's a big triangle) but the sides are identified in an unusual way. [insert  $\triangle YAK$  as described] We have side  $YA$  as "5 more than twice a number," and  $YK$  as "10 less than six times the same number," and side  $AK$  as "15 more than four times the mystery number." What are we supposed to do with all that? Turn each sentence into an algebraic expression. Let  $x$  be the unknown number: "5 more than twice a number" becomes:  $2x + 5 = YA$  "10 less than six times the same number" becomes:  $6x - 10 = YK$  "15 more than four times the mystery number" becomes:  $4x + 15 = AK$  Perimeter is the sum of the sides, so if you put these expressions together, you get:  $2x + 5 + 6x - 10 + 4x + 15 = 118$  km Combine terms:  $12x + 10 = 118$  km Subtract 10 from both sides to isolate the variable:  $12x = 108$  km Divide both sides by 12:  $x = 9$  km Go back to each expression and replace  $x$  with 9 km:  $2x + 5 = YA$   $2(9) + 5 = YA$   $23 = YA$  ...  $6x - 10 = YK$   $6(9) - 10 = YK$   $44 = YK$  ...  $4x + 15 = AK$   $4(9) + 15 = AK$   $51 = AK$  To confirm our sides, add to see if they equal the given perimeter:  $23 + 44 + 51 = 118$  km Well done! You used algebra to solve a perimeter problem! Lesson Summary Now that you have worked your way through the lesson, you are able to define perimeter, recognize the types of triangles, recall and explain a method of finding the perimeter of triangles by adding the lengths of their sides, and, given perimeter, solve for lengths of sides of a triangle using algebra. Next Lesson: How To Find The Perimeter of a Rectangle Perimeter of a triangle is defined as the total length of its boundary. A triangle is a polygon with 3 sides and it can be classified into different types based on the measure of its sides and angles. There are different formulas and methods to calculate the perimeter of a triangle based on the type of triangle. What is the Perimeter of a Triangle? The perimeter of a triangle means the sum of all three sides. The word perimeter is a combination of two Greek words - "peri" which means around and "metron" which means measure. The total distance around any two-dimensional figure is defined as its perimeter. Since perimeter gives the length of the boundary of a shape, it is expressed in linear units. Real-life example: Imagine that we need to fence the triangular park shown below. Now, to know the dimensions of the fence, we add the lengths of the three sides of the park. This length or distance of the boundary of a triangle is called the perimeter of the triangle. Perimeter of a Triangle Formula To calculate the perimeter of a triangle, we simply add the lengths of the sides given. The basic formula used to calculate the perimeter of a triangle is: Perimeter = sum of the three sides Let us understand this formula with the different types of triangles. Perimeter of a Scalene Triangle If a triangle has all three sides of different lengths, it is a scalene triangle. The perimeter of a scalene triangle can be calculated by finding the sum of all the unequal sides. The formula for the perimeter of a scalene triangle is: Perimeter =  $a + b + c$ , where "a", "b", and "c" are the three different sides. Perimeter of an Isosceles Triangle If a triangle has two sides of equal length, it is an isosceles triangle. The perimeter of an isosceles triangle can be calculated by finding the sum of the equal and unequal sides. The formula for the perimeter of an isosceles triangle is: Perimeter of an isosceles triangle =  $2a + b$  where,  $a$  = sides of equal length  $b$  = the third side Perimeter of an Equilateral Triangle An equilateral triangle has all the sides of equal measure. The formula for the perimeter of an equilateral triangle is: Perimeter of an equilateral triangle =  $3 \times a$  where 'a' = length of each side of the triangle. Perimeter of a Right Triangle A triangle which has one of the angles as  $90^\circ$  is called a right-angled triangle or a right triangle. The perimeter of a right triangle can be calculated by adding the given sides. The formula to calculate the perimeter of a right triangle is: Perimeter of a right triangle,  $P = a + b + c$  Since this is a right triangle, we can use the Pythagoras theorem, if any one side of this triangle is not known. The Pythagoras theorem says that the square of the hypotenuse is equal to the sum of squares of the other two sides. Referring to the figure given above:  $a$  = Perpendicular of the right triangle  $b$  = Base of the right triangle  $c$  = Hypotenuse of the right triangle Hence, according to the Pythagoras theorem,  $c^2 = a^2 + b^2$  In this case, the perimeter of a right triangle can also be written as:  $P = a + b + \sqrt{a^2 + b^2}$  This is because  $c^2 = a^2 + b^2$ , therefore,  $c = \sqrt{a^2 + b^2}$  Perimeter of Isosceles Right Triangle A right triangle with two equal sides and two equal angles is called an isosceles right triangle. The perimeter of an isosceles right triangle can be calculated by adding the given sides. The formula to calculate the perimeter of an isosceles right triangle is:  $P = 2l + h$  Another interesting point to be noted here is that using the Pythagoras theorem, we know,  $h = \sqrt{l^2 + l^2} = \sqrt{2} \times l$  or,  $l = h/\sqrt{2}$  Therefore, the perimeter of an isosceles right triangle can also be written as:  $P = 2l + (\sqrt{2}l) = (2 + \sqrt{2})l$  Also,  $P = 2(h/\sqrt{2}) + h = (\sqrt{2} \times h) + h$  How to Find The Perimeter of a Triangle? The perimeter of a triangle can be calculated by following the steps given below: Step 1: Note the measurements of all the sides of a triangle and check that all the sides should have the same unit. Step 2: Calculate the sum of all the sides. Step 3: Give the answer along with the unit. Let us see how to find the perimeter of a given triangle using an example. Example: Find the perimeter of  $\triangle ABC$  having the following dimensions:  $AB = 6$  inches,  $BC = 8$  inches,  $AC = 10$  inches Solution: Step 1: Check if all three sides of the triangle are known.  $AB = 6$  inches,  $BC = 8$  inches,  $AC = 10$  inches Step 2: Use the appropriate formula and add the sides to get the perimeter. Since this is a scalene triangle, we use the formula: Perimeter =  $a + b + c$  Write the perimeter along with its units. Perimeter of triangle  $ABC = 6 + 8 + 10 = 24$  inches. Important Notes: All the sides of a scalene triangle are of different lengths. An isosceles triangle has two sides of equal lengths and the third side of a different length. An equilateral triangle has all its sides of equal lengths. Topics Related to Perimeter of a Triangle Check out some interesting articles related to the perimeter of a triangle. Example 1: Find the perimeter of a right triangle  $PQR$  with sides  $PQ = 4$  inches,  $QR = 3$  inches, and where side  $PR$  (the hypotenuse) is not known. Solution: Given,  $PQ = 4$  inches,  $QR = 3$  inches,  $PR = ?$  To calculate the perimeter of the triangle, we need to know all three sides. We will calculate the dimensions of the hypotenuse ( $PR$ ) using the Pythagoras theorem.  $PR^2 = PQ^2 + QR^2$   $PR^2 = 4^2 + 3^2$   $PR^2 = 16 + 9$  Therefore,  $PR = \sqrt{25}$   $PR = 5$  inches. Now, we can calculate the perimeter of the triangle. Perimeter of triangle  $PQR =$  Sum of the three sides =  $3 + 4 + 5 = 12$  Therefore, the perimeter is 12 inches. Answer: Perimeter of the triangle = 12 inches Example 2: Find the length of the missing side of a triangular-shaped road sign whose perimeter is 48 inches and the two sides are 17 inches each. Solution: Let the length of the missing side be  $b$ . Given, Perimeter = 48 inches. Length of the two equal sides = 17 inches. Perimeter of a triangle = sum of lengths of three sides  $48 = 17 + 17 + b$   $48 = 34 + b$   $b = 14$  Therefore,  $b = 14$  inches Answer: Length of the missing side = 14 inches. Example 3: The perimeter of a rectangular wire is 297 inches. The same wire is bent into the shape of an equilateral triangle. Find the length of its each side. Solution: We know that, perimeter of a rectangle = total length of the wire Length of the wire used = Perimeter of the triangle formed Perimeter of an equilateral triangle =  $3 \times a$   $297 = 3 \times a$   $a = 99$  Answer: The length of each side of the triangle = 99 inches Show Answer > go to slidego to slidego to slide Great learning in high school using simple cues Indulging in rote learning, you are likely to forget concepts. With Cuemath, you will learn visually and be surprised by the outcomes. Book a Free Trial Class FAQs on Perimeter of Triangle The perimeter of a triangle is defined as the total length of its boundary. It is the sum of all the three sides of the triangle. What is the Formula of Perimeter of Triangle? The perimeter of a triangle can be calculated by simply adding the length of all the sides. The basic formula to calculate the perimeter of a triangle with sides 'a', 'b', and 'c' is:  $a + b + c$ . How Do You Find the Perimeter of a Triangle With Three Equal Sides? To calculate the perimeter of a triangle with three equal sides, we add the length of all sides, or multiply the length of any one side by 3. Such a triangle is called an equilateral triangle. The formula to calculate the perimeter of an equilateral triangle is  $3a$ , where 'a' is the length of each side. Can a Triangle Have the Same Area and Perimeter? A triangle can have an equal perimeter and area only in some special cases. These shapes having an equal perimeter and area are called equable shapes. Thus, a triangle with an equal perimeter and area is called an equable triangle. How Do You Find the Third Side and Perimeter of a Right Triangle Given Two Sides? The third side of a right-angled triangle can be calculated using the measure of the other two sides, by applying the Pythagoras theorem. According to the Pythagoras theorem, for any right-triangle with sides 'a', 'b', and 'c',  $c^2 = a^2 + b^2$  where,  $a$  = Perpendicular of the right triangle  $b$  = Base of the right triangle  $c$  = Hypotenuse of the right triangle The perimeter of a right triangle is calculated with the formula:  $P = a + b + c$  How Do You Find the Perimeter of a Triangle With Coordinates? If the coordinates of a triangle are given, then the length of all its sides can be calculated using the distance formula. Once these lengths are obtained, we can simply add them to find the perimeter of the given triangle. How Do You Find the Perimeter of a Triangle With Two Equal Sides? To calculate the perimeter of a triangle with two equal sides, we find the sum of length of all the sides. This type of triangle is called an isosceles triangle. The formula to calculate the perimeter of an isosceles triangle is:  $2a + b$ , where 'a' is the length of one of the equal sides, and 'b' is the length of the third side. what is the formula of perimeter of equilateral triangle. what is the formula of perimeter of isosceles triangle. what is the formula for finding the perimeter of a triangle. what is the formula of perimeter of right angle triangle. what is the formula of semi perimeter of triangle. what is the formula for area and perimeter of a triangle. what is the formula for finding the semiperimeter of triangle. what is the formula for finding the perimeter of an equilateral triangle

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