Arc length and sector area formula

Definition: The number of squareunits it takes to accurately populate the sectors in a circle. Drag and bob one of the orange points that define the endpoint of the sector. It is recalculated when you drag an area area. What the formula does is take an area of the entire circle and then take part of it, depending on the part of the circle that the sector fills. For example, if the center angle is 90°, the sector will have an area that corresponds to one-fourth of the total circle. If you know the central angle you have: C is the radius of the circle where the center angle of the degree r is part of π. If you know where the arc length: L is the arc length. R is the radius of the circle where the sector is part. The sector area is proportional to the length of the arc, and the area enclosed by the sector is proportional to the arc length of the sector. For example, in the figure below, arc-length AB is a quarter of the entire perimeter, and the sector area is a branch of the circle area. Similarly down, the arc length is half the circumference and the area is half of the entire circle. You can experiment with different ratios on the applets at the top of the page. Other circles are subjected to the general equation of the circle angle in the circle angle central angle central angle clearance arc (C) 2011 copyright mathematical open reference. All-rights booking A-circle has always been an important figure among all geometric figures. There are various concepts and formulas associated with a circle. Sectors and segments are probably the most useful. This article will focus on the concept of the original sector, along with areas and boundaries in one area. One sector is said to be part of a circle made of arc of a circle with two objections. It is part of a circle formed by a portion of the circle circumference (arc) and the radius of the circle at the positive end of the arc. The shape of the one-sector can be compared to a slice of pizza or a pie. Before you learn more about this area, let's learn some basics of the circle. What is a circle? A circle is a trajectory of a point away from a given point in the center of the circle. The common distance from the center of the circle to the point is called a radius. Therefore, the circle is defined by the center (o) and the radius (r). Circles are also defined by two properties: area and perimeter. What is the formula for two measures in a circle = the boundary of the circle = φr 2 in the sector of the circle = 2φr circle? This sector is basically part of a circle that can be defined based on these three points mentioned below: a circular sector is part of a disk surrounded by two opposites and arcs. Sectors divide circles into two regions: major and minor sectors. Small areas are known as minor sectors, whereas The region is known as the main sector. In the circle with the radius r and center of the area O of the sector ∠POQ = γ (degrees) at the angle of the sector. Then, the area of the circle formula sector is calculated using a single method. The area of the given angle is represented by the area of the sector: the angle of the sector is 360 °, the area of the sector, that is, if the entire circle = γr2 angle is 1 °, sector = γr2/360 ° so, the angle is defined as γ, the area of the sector, OPAQ; Let's see the angle at 45°. Therefore, the circle is divided into eight parts, as given in the picture below. You can now calculate the sector area for the figure above as (1/8) (3.14×r×r). Therefore, the area of the sector is calculated as follows: similar to the length of the arc of the sector formula, the length of the arc (PQ) of the sector with the angle γ, is given by; L = (γ /360) × 2γr (or) l = (γγr) / 180 when the arc length of the sector is given instead of the angle of the sector there is another way of calculating the area of the sector. Make the length of the arc l. For the radius of the same circle as the r unit, the length r unit is the arc of the unit that is halved into one radian in the center. Therefore, you can conclude that the arc of length l is subtend, which is the angle of the center of the arc. Therefore, if l is the arc length, r is the radius of the circle and γ is a subtle angle to the center. γ = l/r, where γ is in radian. If the angle of the sector is 2γ, the area of the sector (the entire sector) is the area of the sector if the γr2 angle is 1 = γr2 / 2γ = r2° because the angle is γ, the area of the sector = γ× r2 /2 A = (r / r) × (r2 / r) × (r2 /2) some examples are discussed. Example 1: If the angle of a sector with a radius of 4 units is 45°, look for the length of the sector. Solution: Area = (φ/360°) × γr2 = (45°/360°) × (22/7) × 4 × 4 = 44/7 square units the same sector = (φ/360°). × 2 φr l = (45°/360°) × 2 × (22/7) × 4 l = 22/7 Example 2: The radius of the circle is 16 units and the length of the arc is 5 units, when the area of the sector is located. Solution: If the arc length of the circle with a radius of 16 units is 5 units, the sector area corresponding to the arc; A = (lr)/2 = (5 × 16)/2 = 40 square units. The boundary of the boundary circle sector of the sector is two and a half lengths, with the arc creating the sector. In the following diagram, the sectors are shown in yellow. The boundary should be calculated by doubling the radius and then adding it to the length of the arc. The boundaries of the sector formula are as follows: sector = radius + arc length boundary = 2 radius of sector = 2 radius + arc length relationship: arc length = l = (φ/360) × 2γr, sector = 2 radius + (φ/360) × 2γr) for example, circular arc 12cm 30 ° in the middle. Find the boundaries of the formed sectors. use π = 3.14. Solution: given its r = 12cm, φ = 30 ° = 30 ° × (π/180 °) = π/6 boundaries of the sector is given by the formula; P = 2 r + r γ P = 2 (12) + 12 (π/6) P = 24 + 2 π P = 24 + 6.28 = 30.28 So the boundary of the sector has two main slices of 30.28 cm slice source: pizza slice is called sector. And the segment cut from the circle by the code (the line between the two points of the circle). Try them! Common sector quadrants and semi-circles are two special types of sectors: half circles are semi-circles. The branch of the circle is quadrant. You can compare the angles to the angle of the entire circle to determine the sector area. Note: We're using radians at an angle. This is inference: the circle has an angle of 2φ: the γr2 A sector has an angle of φ instead of 2φ, so the area can be simplified to φ2× ×γr2: φ2× sector = φ 2 × r2 (if γ is in radian) sector = × π 360 × r2 (when the segment is in the segment) is a sector that subtracts the triangular piece of the region (blue(blue). For a long reason, the result is a slight modification of the sector formula: segment = γ - neo (γ) 2 × r2 (when γ is in radian) segment = (γ × π 360 - sin (γ)2) × r2 (degrees when there is γ) arc Length (sector or segment): L = γ × r (when γ is in radian) L = γ × φ180 × r (when γ is in the province) copyright © 2017 MathsIsFun.com circle is a 2D shape with no sides and corners. Landscape - the circumference is always the same distance from the center. Sectors, segments, arcs, and codes are different parts of the circle. The word problem, linear speed, as can be remembered in the shape, is given area A of the circle having a radius of length r: the circumference of the same circle is given C (i.e. the length of the outside): these formulas give us the area and arc length (i.e., arc length or curve line) for the entire circle. But sometimes we have to work only part of the circle revolution or with many revolutions in the circle. If so, what formulado do you use? If you start with a circle with a displayed radius line and rotate the circle slightly, the marked area looks like a pie wedge or a piece of pizza. This is called the sector of the circle, and the sector looks like the green part of this figure: the angle shown by the original and final position of the radius (i.e. the angle of the center of the pie/pizza) is the subtle angle of the sector. This angle can also be referred to as the central angle of the sector. In the illustration above, the center angle is shown as Δ (pronounced THAY-tuh). What is the area A of the subtly sector by the displayed central angle γ? What is the length of the arc, the part of the circumference is dependent This angle? To see these values, let's take a closer look at the area and perimeter formulas. The area and perimeter are for the entire rotation of the radius line, for the entire circle. The subtleangle of one full revolution is 2φ. Therefore, the formula for the area and perimeter of the entire circle can be mentioned again as a circle: what is the point of dividing the value of one angle? We did this to highlight how the angle (2φ) of the entire circle fits into the formula of the entire circle. Then you can see exactly how and where the subtly angle of the sector γ fits into the sector formula. You can now replace the ambient angle (i.e., 2φ) once for the entire circle with the sub-angle γ scale of the sector, which provides a formula for the area and arc length of the sector. : Confession: A large part of the reason for describing the relationship between the circle formula and the sector formula is that the sector area and arc length formula cannot be tracked. I always forgot them or messed them up. But I could always remember the formula for the area and perimeter of the entire circle. So I learned that i can always keep things straight by pointing out where the angles are going in the whole circle formula with the above relationships in mind. They gave me a radius and a central angle, so I can connect directly to the formula and simplify it to get my answers. For convenience, first convert 45° to its radian value. Then I'm going to do my plug n-chug: The next my answer is: Region A = 8γ square unit, arc length s = 2γ unit to see how to put the unit in my answer. If I had specified a specific unit for a radius of centimeters or miles or whatever, it would have been more specific to my answer. At that time, I had to be common. If the question does not specify a unit or says it is a unit, you can run away without having to put the unit in the answer multiple times. However, this often leads to bad habits of completely ignoring units, and - surprises! — The instructor calculates the test because it did not include the unit. It's probably better to go wrong on the side of caution, and always put some units in, it's just units, in your answer. In this exercise, we gave you a radius and arc length. To find the area of this division, I needed a central angle measurement, and they didn't give me. However, the formula for arc length includes a central angle. Therefore, the radius and arc length can be connected to the arc length formula and solved for the measurement of the subd angle. Once I have it, I can plug and chug to find the sector area. Therefore, the central angle of this sector is measured. Then the areas of the sector are: This value is the numeric part of my answer. This value refers to an area that is a square dimension, so let's remember if we want to put squares in quasi-units over a radius. Sometimes exercise gives you information, but as above, it may not look like the information you actually need. Don't be afraid to fiddle with values and formulas. Find out if you can figure out a backdoor for a solution or do whatever you want. At first, you don't know how to get to the end. (And remember that if you give or request a diameter, the radius is half the diameter and the diameter is twice the radius.) They asked me for diameter. The formula I learned uses a radius. However, it is not a problem as you can find the radius and then get twice the diameter. However, they've asked me for length, given the arc length and area, using a radius and a subtended angle, respectively. So what should I do? When I can't think of anything else to do, I connect with whatever they gave me to whatever formula may be related, I hope i deleted it for something I could use. So: I can replace it with the first line above from the second line above (after some rebalancing), make sure the results help me at all: ha! I found the radius value! I noticed that i don't have value for the central angle, but they didn't ask for it and didn't need it anyway. My answer (including units!) because they demanded a diameter that was twice the radius!) The URL: