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Circles p and q are tangent to each other at point s

Task 7 By David S. Park In this exploration, let's look at the tangence of lines and circles, and the special properties that are involved with them. If a tangent line to a circle, then that means the line touches the circle on exactly one point. A circle can be tangent to another circle, which means these two circles touches on exactly one point. A circle and a line What are the possibilities of intersecting a line and a circle? As shown in the figure below, a line can play a circle at one point, two points, or none. We say a line is tangent to a circle if the line touches the circle on exactly one point. Different possibilities of intersection of the line and circle there is a special property when the line is tangent to a circle. In this case, the radius from the center of the circle to the tangent point is perpendicular to the tangent line. Property of the tangent line and radius of a circle Two circles How can two circles cross each other? Similar to the first case of a line and a circle, two circles can intersect each other at one point, two points, or none. Different possibilities of intersection of two circles when two circles touches each other in exactly one point, then we say that the two circles are tangent to each other. In this case, the two circles share a common tangent line at the tangent point. The common tangent line of two tangent circles a special property can be observed when the two circles are tangent to another; as this common tangent line is perpendicular to both the rays of each circle at that point, it follows that the two Rays and the tangent point are found along the same line. In addition, the two circles can be tangent in a different way. In this different arrangement, the two circles share the same tangency point and line of tangence at which point, which implies that the tangent point and the two centers situated along the same line. Two circles are tangent in a different way; Three points c, c' , and tangent point lie along the same line a circle tangents to both a line and a circle at the same time given a line and a circle, we can construct a circle so that the circle is tangent for both Circle and the given line. For example, the circle (orange) is tangent to the circle both the given C and the line given in addition, the circle can be tangent to both the circle given and the line in a different way (lower left figure). As explained from the sections above tangence, the recently built circle (orange) circlly (orange) is perpendicularly the given line, and also recently built circle will have its center, the tangent point between the two circles , and the center of the Dada Lie Circle along a straight line. Relations within this case is shown in the lower right figure. Another cyst centered on B is also tangent to the circle given C and the line given now, the main question is as it is to locate the center of such a circle that is tangent both for a given line and a given Circle, and build such a circle. We need to use some geometry to discover the location of the center of this desired circle. We can use geometric relations that will give us the exact location of the circle that will be tangent to both a given line and the circle given. Possibility # 1 We will choose a point p in the circle given that we want the recently tangent circle built on. We will do in the imaginary circle that will give the desired conditions, then try to look for a relationship that will give point A. Location. Remember that the radius of point A to The tangent line is perpendicular and that the points C, P, and find it along a straight line. We see that the radius of the circle is the same length, and this seems to be a good condition to use to find the From point A. If you build a tangence line of Point P, then we can build two triáms congruent APQ and ARQ. The two triágulus APQ and ARQ are congruent, because $AP = AR$ (ray of Circle), line aq is common, and $APQ \text{ angle} = ARQUIL \text{ ARQ} = 90 \text{ degrees}$. Thus, if we use the relationships of $pq = QR$, and the line aq being the bisectriz of the angle PQR, then we can locate point A. The central point that of the circle wishes to create, will rest along the intersection Ray CP and Ray Aq. ** However, this construct does not work correctly with GSP, because we lose the tangent line at point P, when point P moves to the other side of the circle. For this method of construction of the circle to work, it will need three different cases that depends on where Point P is located. In conclusion, do not use this method !! (I I WAS WAS WAS A QUANTITTANT TIME DOING THIS FASHION TT) Possibility # 2 (recommended) Possibility This time, let's choose a point P on the given line and try to locate the center of a circle that will be tangent both at the given At what point chosen and also for the given circle. Let's draw in the circle that will have these properties in order to exploit some relationship that will give to the center of the circle you want to create. How can we locate the A Center? Remember that our goal is to find a center that is tangent both for the circle given and line, and notes that we can not find the center of a directly because we still do not know the size of the ray. From the diagram above, it is known that point A must be found along the perpendicular from point P, if the circle is to be tangent at point p for the line. In this approach, a length equal to the radius of the circles given C will be added to the other side of the point P, so that a triácular isósceles can be formed, and then point A can be located from From the height of said triangle isósceles. This is, if the R-ray of the circle given is added at the point p in direct direction, the addition of a segment of length r at point P, so we can create a trian ACQ Islands. The height of this triangle is responsive of the mid-point segment will cross with the perpendicular radius at point P, thus giving our central point A. desired (remember that we still do not know the angle or Location of the CA. Segment) Special Islands TRIANCE ACQ ABSTRACT OF THE STEPS FOR THE CHILD OF A CIRCHING TANGENT OF A CIRCHING AND A LINE. 1. Given a line and a circle with R-ray, choose an arbitrary point on the line. Then draw a perpendicular radius through Point P. Step # 1 2. From point p to the lower side of the perpendicular radius, get a point q such a segment $pq = \text{cycle radius given } r$. (An easy way to achieve this is to call a circle center at Point P of Ray R.) Step # 2 3. Connect point C and point q, which will be the basis of the triangle Special Islands. Then locate the middle point of CQ and shoot a perpendicular radius through this medium point. Step 3 # 4. The intersection point between the perpendicular of the CQ and the perpendicular point from point P gives the center of the circle we wish to create. We are done! Step # 4 *** In the same way, the circle can be constructed that encompasses the given circle and tangent to the circle both the data and the line. How to find the center of another Tangent Circle Case Exploration of the Locus from the Tangent Crade Center to both certain line and circle. In this exploration, we will investigate the locus of the centers of the circles that we created from the previous sections. We will build both cases of circles that are tangent to a certain circle and a certain line, tracing the locus of the centers of these circles. Circle centered in C and given blue line; The circles are tangent centered in A and B in the first place, we will trace the center point of the orange circle, which is the image on the left side, and then locate the central point of the red circle . The center point locus (left) and b (right): smile ~ in both cases, we have a This can be figured geometrically through the construction of a parallel line at the data line, which will be length r away, either for the top or the bottom of the line. For the circle of orange, the construction of a The line as in the diagram below show that point B is always equidistion of point C and parallel line covered. The point A is equidistance from the Circle Center and parallel line covered until now the circle provided and the given line was separated and does not touch. Now let's investigate when the circle supplied and the determined line intersect in two points. Case 1 of when given circle and given the intersect line Remember that we had another case of a circle that could be tangent for the given circle and the line given. If we track the locus of this red circle in the same circle and intersection line, then we received the diagram below. (Case 1 and Case 2 could be and possibly must be withdrawn in the same diagram.) Case 2 when the circle supplied and the line cross, therefore, we can conclude that when the circle supplied and the determined line, the locus of the center of a tangent circle for the circle given and the given line will be of two parabolas, each facing the opposite direction. And for the last investigation, the given circle and the given line can be tangent with each other. In this case, tracing the center locus of a tangent circle to the given circle and the given line gives a straight line perpendicular line (a degenerate pardon) and a parábola. When the circle given and the line given are tangent return to David's house assumed the knowledge introductory plan geometry involving points and lines, parallel and transversal lines, sums of triáms and quadrilaterals and general persecution . Experience with a leading argument in written geometry as a sequence of steps, each justified for a reason. Constructions of RA © Gua and Compasses. The four standard congruence tests and your application to prove properties and tests for special triáms and quadrilrters. The four standard similarity tests and your application. Trigonometry with triágulos. Motivation Most of the geometry involved triágans and quadrilaterals, which are formed for row intervals, and we now return to the geometry of the circles. Lines and circles are the most elementary figures of geometry - a line is the locus of a point moving in a constant direction, and a circle is the locus of a point moving to a distance Constantly of some fixed point «and all our constructions are made by drawing lines with a straight edge and caps with bacts. Tangents are introduced in this module, and subsequent tangents become the basis of differentiation in the calculation. The theorems of the geometry of the circle are not intuitively obvious to the student, in fact, most people are surprised by the results when they first come to them. They clearly need to be proven carefully, and the intelligence of the evidence developed in previous models is clearly displayed in this module. Logic is more involved - the division in cases is often needed, and the results of different parts of the previous geometry modules are often gathered within a test. Students traditionally learn a greater respect and assessment of the mathematics of their study of this imaginative geometric material. The technical importance of the circles is reflected in the incredible number and the variety of situations in the science, where the circles are used a é á ê

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