# Concurrency & the Circumcenter

ID: 11301

Time Required
*45 minutes*

## Activity Overview

*In this activity, students will explore the perpendicular bisectors of the sides of a triangle. Students will discover that the perpendicular bisectors are concurrent. The point of concurrency is the circumcenter. Students should discover the relationship between the type of triangle and the location of the point of concurrency.*

## Topic: Circumcenter

- *Perpendicular Bisector Theorem*
- *Circumcenter*
- *Concurrent*
- *Point of Concurrency*
- *Circumscribed Circle*

## Teacher Preparation and Notes

- *This activity was written to be explored with TI-Nspire technology.*
- *This is an introductory activity where students will need to know how to change between pages, construct triangles, construct circles, grab and move points, measure lengths, and construct the perpendicular bisector.*
- ***To download the student and solution TI-Nspire documents (.tns files) and student worksheet, go to education.ti.com/exchange and enter "11301" in the quick search box.***

## Associated Materials

- *Circumcenter_Student.doc*
- *Circumcenter.tns*
- *Circumcenter_Soln.tns*

## Suggested Related Activities

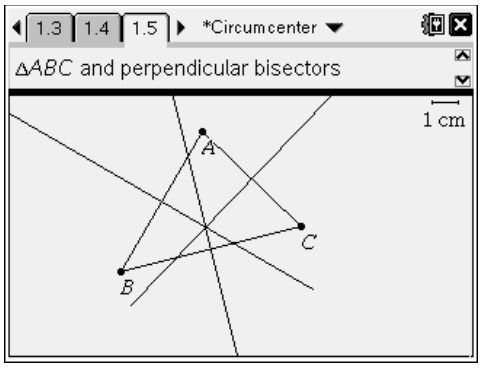
*To download any activity listed, go to education.ti.com/exchange and enter the number in the quick search box.*

- *Circumscribing a Circle about a Triangle (TI-84 Plus family) — 6868*
- *Chords and Circle (TI-Nspire technology) — 9423*
- *Exploring the Circumcenter of a Triangle (TI-84 Plus family) — 6862*
- *Circumcenter and Incenter (TI-84 Plus family)— 4616*

**Problem 1 – Exploring the Perpendicular Bisectors of a Triangle**

Students will draw an acute triangle and label it *ABC*.

Students will need to define concurrent and point of concurrency from their textbook or another source. Students will be exploring the perpendicular bisectors of the three sides of a triangle and discover that they are concurrent. The point of concurrency is the circumcenter. The students are asked various questions that can be answered on the handheld or the accompanying worksheet.

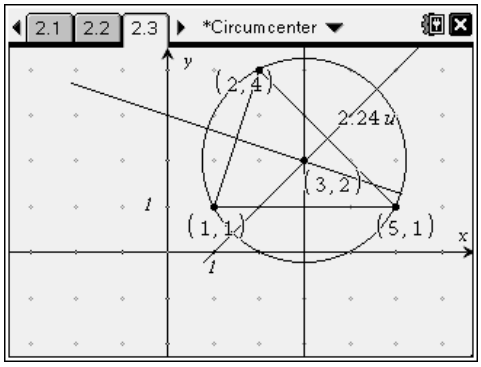



***Student Solutions***

1. When three or more lines intersect at one point, the lines are said to be concurrent.
2. The point of concurrency is the point where the concurrent lines intersect.
3. They are concurrent.
4. Yes, a right triangle.
5. Yes, an obtuse triangle.
6. Yes, an acute triangle.
7. Distances will vary. The distances are all congruent or equal.
8. The circle goes through all three vertices.
9. The radius of the circle will vary, but is the same as the distance found in Question 7.

**Problem 2 – An Application of the Circumcenter**

Students are given two application problems involving the circumcenter of a triangle. Students are to find the circumcenter of the triangle formed by the three coordinate pairs.




***Student Solutions***

1. The continuous flame should be located at the point (3, 2) on the grid. The radius is 2.23607 units or 2.23607(100) = 223.61 feet.
2. Locate at (3, 3.33) with a radius of 3.073(10) = 30.73 feet