Inscribed Angles Theorem

ID: 12438

Time Required
15 minutes

Activity Overview

Students will begin this activity by looking at inscribed angles and central angles and work towards discovering a relationship among the two, the Inscribed Angle Theorem. Then, students will look at two corollaries to the theorem.

Topic: Circles

- *Construct central and inscribed angles*
- *Inscribed angles theorem*

Teacher Preparation and Notes

- *To complete this activity, students will need to know how to change between pages, grab and move points.*
- *The multiple-choice items are self-check and students can check them by pressing* (menu) *and select* ***Check Answer*** *(or pressing* (ctrl) *+ ▲).*
- ***To download the student and solution TI-Nspire documents (.tns files) and student worksheet, go to education.ti.com/exchange and enter "12438" in the quick search box.***

Associated Materials

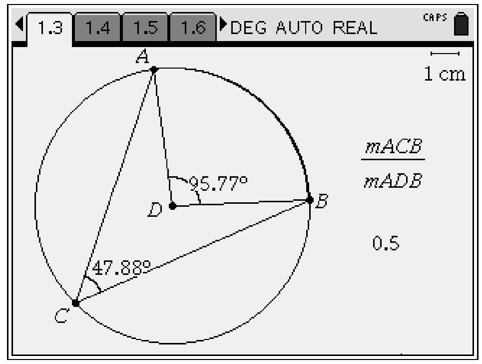
- *GeoWeek25_Inscribed_Worksheet_TINspire.doc*
- *GeoWeek25_Inscribed.tns*

Suggested Related Activities

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

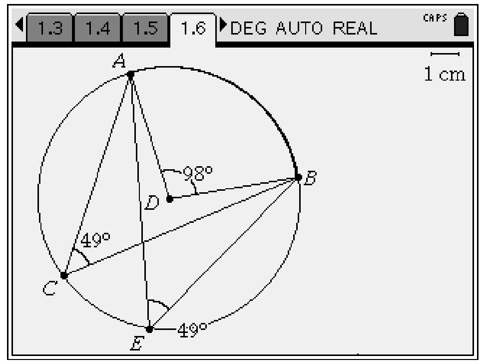
- *Inscribed and Central Angles in a Circle (TI-Nspire technology) — 9054*
- *Inscribed Angles (TI-Nspire technology) — 9687*
- *Central versus Inscribed Angles in Circles (TI-84 Plus Family) — 7111*

Problem 1 – Similar Triangles



Students will begin this activity by looking at inscribed angles and central angles and work towards discovering a relationship among the two.

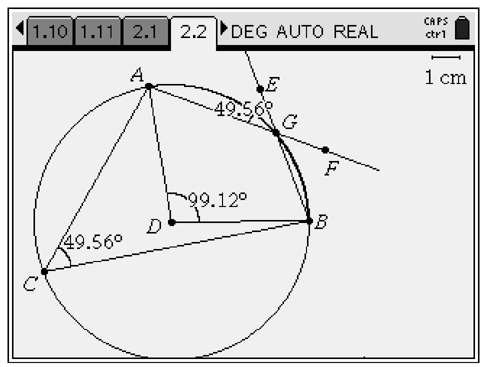
Students will be asked to collect data by moving points *A* and *C*. Students are asked questions about the relationships in the circle and are asked to make a conjecture. In order to calculate the ratio of $m\angle ACB$ to $m\angle ADB$, students can use the **Text** tool and the **Calculate** tool in the Actions menu.



On page 1.6, students will look at two inscribed angles intercepted by the same arc and are asked to make a conjecture about the relationship.

In an advanced setting, a proof of the inscribed angle theorem and the two conjectures in problem one are appropriate and can be proved using isosceles triangles.

Problem 2 – Extension of the Inscribed Angle Theorem



In Problem 2, students will look at two more angles created from the central angle and the intercepted arc. Both sections of this problem are corollaries of the Inscribed Angle Theorem and both solutions are congruent to the measure of the central angle intercepted by the arc or one-half the measure of the central angle.

Student Solutions

1. Sample answers

Position	Measure of $\angle ACB$	Measure of $\angle ADB$	$\frac{m\angle ACB}{m\angle ADB}$
1	48.79°	97.57°	0.5
2	39.19°	78.39°	0.5
3	31.03°	62.06°	0.5
4	31.03°	62.06°	0.5

2. $\frac{1}{2}$

3. Sample answers

Position	Measure of $\angle ACB$	Measure of $\angle AEB$
1	49°	49°
2	37.12°	37.12°
3	60.22°	60.22°
4	60.22°	60.22°

4. Sample answer: They are congruent.

5. diameter of the circle

6. 90°

7. Sample answers

Position	Measure of $\angle ACB$	Measure of $\angle ADB$	Measure of $\angle AGE$
1	51.58°	103.17°	51.58°
2	62.74°	125.49°	62.74°
3	56.47°	112.93°	56.74°
4	56.47°	112.93°	56.74°

8. $\frac{1}{2}$

9. Sample answers

Position	Measure of $\angle ACB$	Measure of $\angle ADB$	Measure of $\angle ABE$
1	56.6°	113.21°	56.6°
2	39.26°	78.52°	39.26°
3	55.69°	111.39°	55.69°
4	61.88°	123.77°	61.88°

10. $\frac{1}{2}$

