

Investigating Inscribed Angles

by – Dennis Ivany

Activity overview

An investigation of the relationship between inscribed angles subtended by the same arc or chord.

Concepts

Inscribed Angles
Cyclic Quadrilateral

Teacher preparation

Load the activity *geometry_inscribedangles_ivany* on each TI Nspire to be used in the lesson.

Classroom management tips

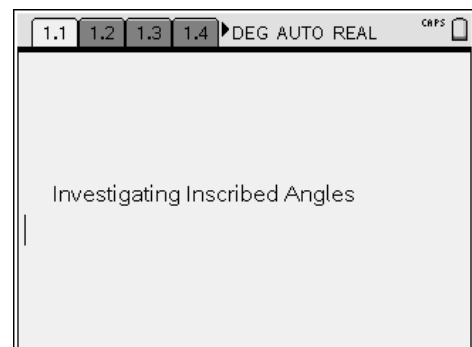
This lesson is meant to be self-directed. However, it may be helpful for the teacher to ensure students are familiar and comfortable with the definitions on slides 1.2 and 1.3.

TI-Nspire Applications

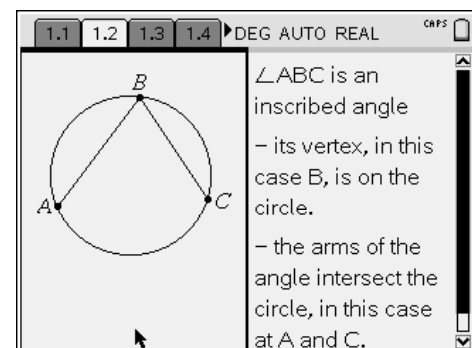
Graphs and Geometry
Notes

Step-by-step directions

Open the document **geometry_inscribedangles_ivany**.



Ensure you are familiar with the definitions on these two slides.

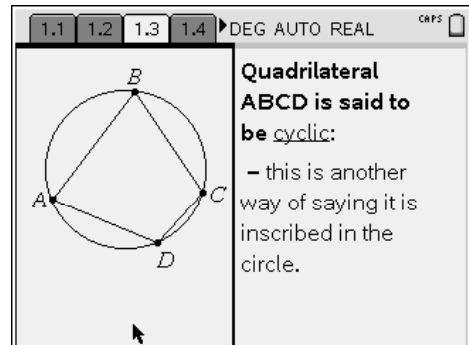



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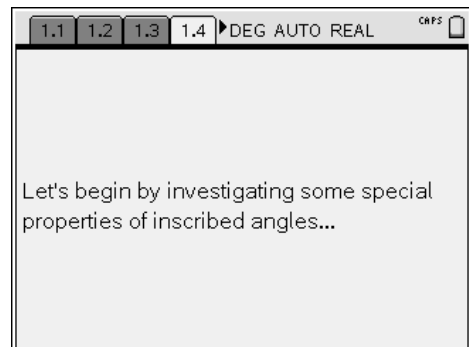
by: Dennis Ivany
 Grade level: secondary
 Subject: Geometry
 Time required: 45 to 90 minutes

Materials: TI-Nspire

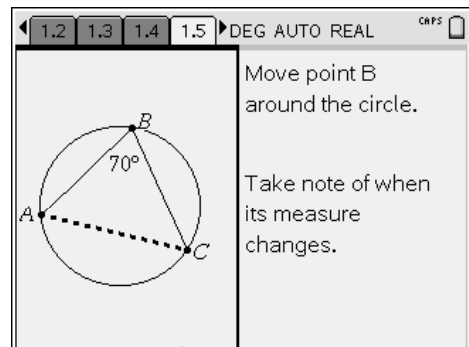
The beginning of the investigation.




Move the hand to point B until the point flashes, press **ctrl**  and move the point around the circle.

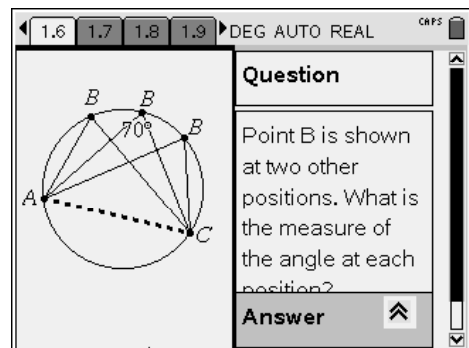


See if the angle measure changes as you rotate the point.



Press **ctrl** **tab** to move to the question on the right side. Type your answer immediately after the question.


Check your answer against the one provided by pressing **tab** .




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Move the hand to point B until the point flashes, press **ctrl**  and move the point around the circle to the same position as point D.

Press **ctrl** **tab** to move to the question on the right side. Type your answer immediately after the question.

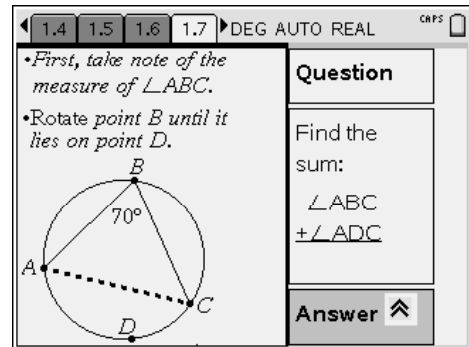
Check your answer against the one provided by pressing **tab** .

An opportunity to explore using a different angle.

Again, rotate point B to different positions.

Related questions are on the net two slides.

Type your answer immediately after the question, then check your answer against the one provided.




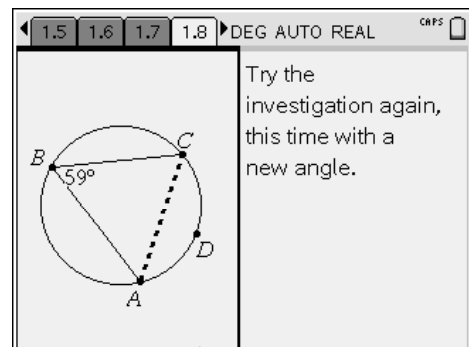
1.4 1.5 1.6 1.7 DEG AUTO REAL CRPS

- First, take note of the measure of $\angle ABC$.
- Rotate point B until it lies on point D.

Question

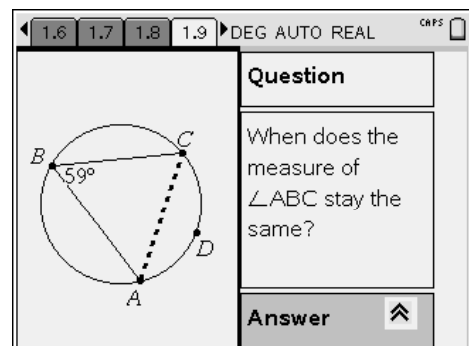
Find the sum:
 $\angle ABC$
 $+$ $\angle ADC$

Answer 



1.5 1.6 1.7 1.8 DEG AUTO REAL CRPS


Try the investigation again, this time with a new angle.



1.6 1.7 1.8 1.9 DEG AUTO REAL CRPS

Question

When does the measure of $\angle ABC$ stay the same?

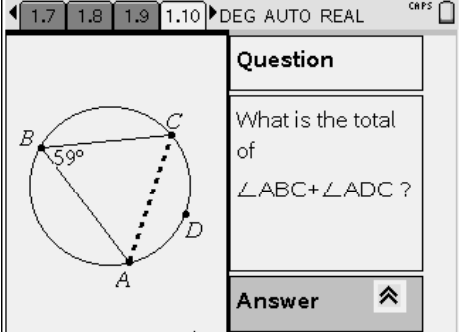
Answer 

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Type your answer immediately after the question, then check your answer against the one provided.



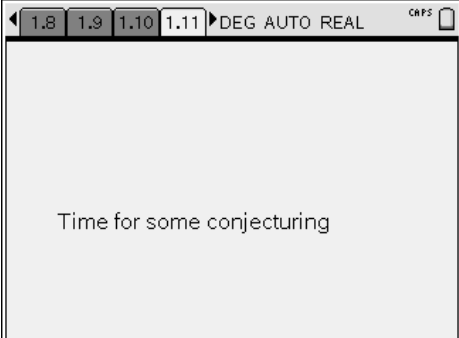
1.7 1.8 1.9 1.10 DEG AUTO REAL CRPS

Question

What is the total of $\angle ABC + \angle ADC$?

Answer ⬆

A series of questions and answers to help consolidate the learning.



1.8 1.9 1.10 1.11 DEG AUTO REAL CRPS

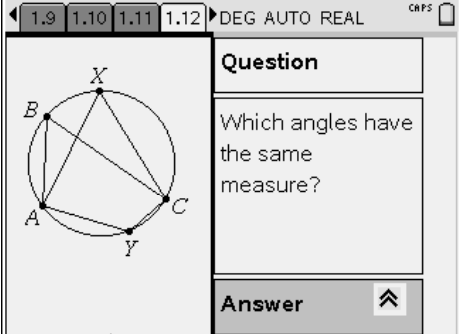
Time for some conjecturing

If you are stuck, perhaps using the angle measurement tool (**menu** 7 4) will help.

Click on point A, then B, then C to get the measure of $\angle ABC$, then rotate point B to positions X and Y.

You may also find it helpful to construct the chord AC which subtends $\angle ABC$ using the **Segment** tool,

(**menu** 6 5).



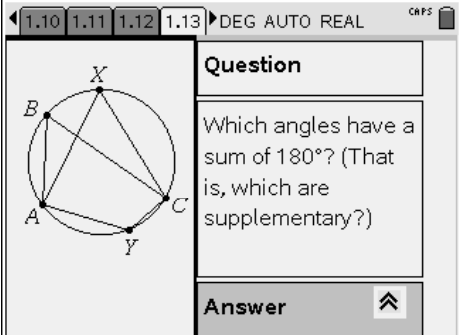
1.9 1.10 1.11 1.12 DEG AUTO REAL CRPS

Question

Which angles have the same measure?

Answer ⬆

Hint: There are four pairs of supplementary angles.



1.10 1.11 1.12 1.13 DEG AUTO REAL CRPS

Question

Which angles have a sum of 180° ? (That is, which are supplementary?)

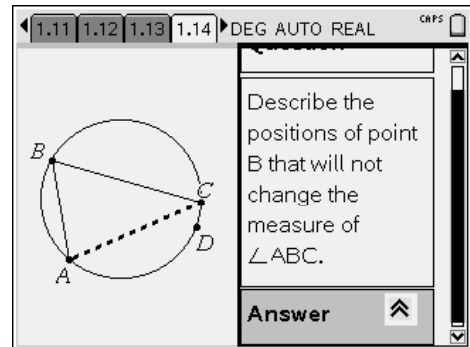
Answer ⬆

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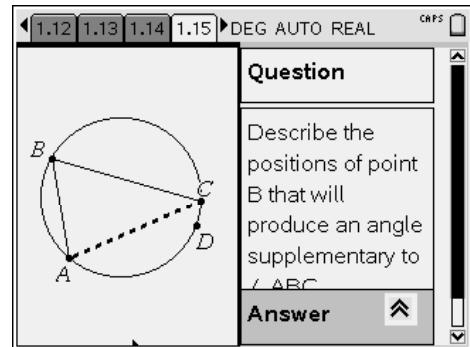
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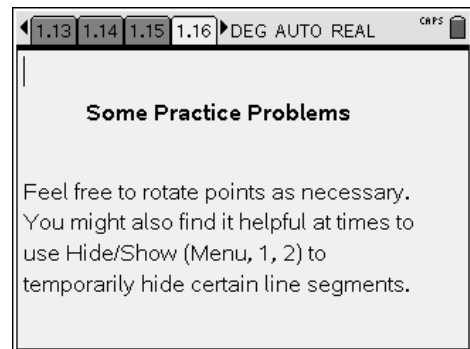
You can explore this question by rotating point B again.



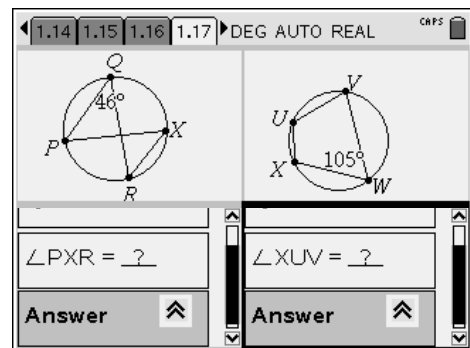
You can explore this question by rotating point B again.

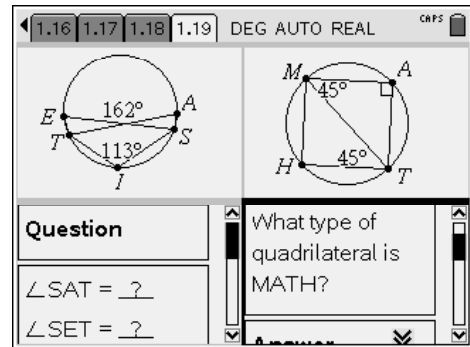
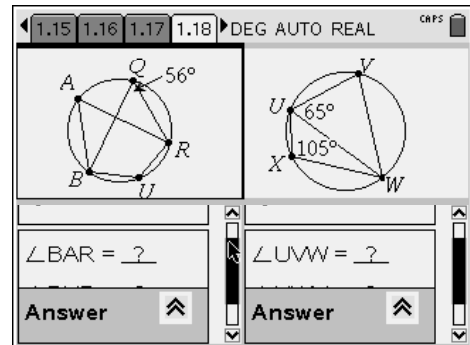


An opportunity to practice what you have learned.



Press **ctrl** **tab** to move between the sections so you can type in your answers for the questions.





Assessment and evaluation

Journal Ask the students to write about what they learned regarding when two inscribed angles are congruent and when their measures are supplementary.

Exit Slip As permission for leaving the class, ask the students to write about what they understood and what they did not understand on a sheet of paper and pass it in before leaving the class.

Red-Yellow-Green On a sheet of paper, each student should write one of the words Red, Yellow, or Green according to the following codes:

Red - I don't understand at all and need some help.

Yellow - I understand mostly but I need a little help.

Green - I fully understand

As the teacher circulates through the room, it will be easier to pinpoint those who need specific help.

Assignment Provide a follow-up set of practice questions for students to pass in. This can be on paper or on the TI-Nspire.