

Math Challenge® Student Edition

USA TODAY

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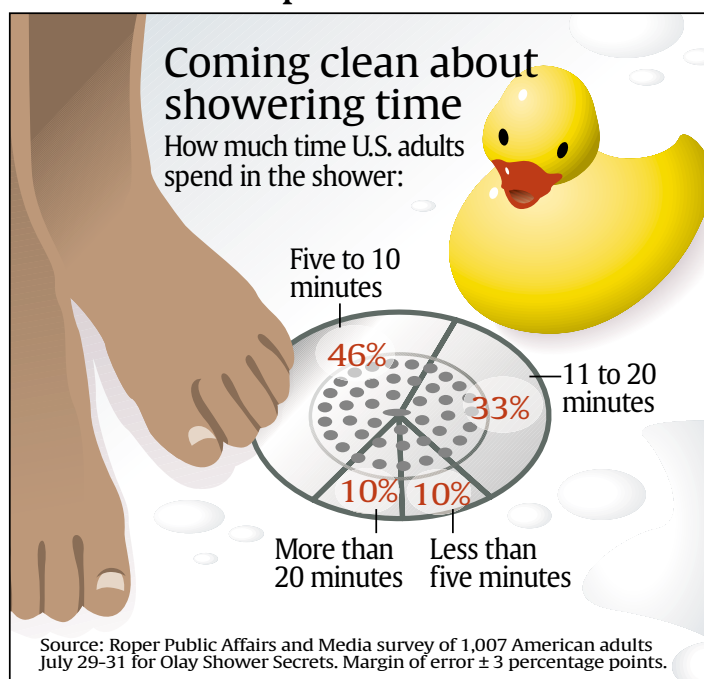
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Coming clean about showering time

USA TODAY Snapshots®



By Mary Cadden and Alejandro Gonzalez, USA TODAY

Activity Overview:

In this activity using the USA TODAY Snapshot,® “Coming clean about showering time,” you will find the measures of central angles and arcs of a circle. You will use circumference, radius, concentric circles and degrees in a circle to determine the measures of the cen-

Focus Questions:

Q. Each section of the circle graph represents a measurable quantity. What is that quantity?

Q. How many people spend 10 minutes or less in the shower?

Q. The USA TODAY Snapshot “Coming clean about showering time” shows that 79% of the respondents spend five to 20 minutes in the shower. What is the measure of the angle (in degrees) formed by these two groups? What is the measure of the length of the arc formed by the two adjacent arcs?

Q. Identify two concentric circles in the USA TODAY Snapshot “Coming clean about showering time.” How much farther is it around the outer circle?

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This activity was created for use with
Texas Instruments handheld technology.

Coming clean about showering time

Procedure:

Activity 1: You will explore the relationship of the measure of a central angle of a circle. Complete Activity 1 before answering the questions.

Cabri Jr. Directions:

- Press **⓪**, and select Cabri Jr.
- Press **⊥** (π), select **Open...**, and press **⏏**. Highlight **CIRCLE** and press **⏏**.
- The measures of four central angles are shown. Use the hand cursor to grab a point of the radius that is on the circle and drag it using the arrow keys to change the angle measures of two adjacent central angles. On the right side of your screen is the sum (360°) of the measures of all central angles in the circle.

Q. What do you notice about this sum as you change the measures of the central angles? _____

Definitions: This activity is designed to help you understand central angles and arc length. Use your book to write a definition of each of the following:

- Central angle
- Arc (major and minor)
- Concentric circles
- Arc length

Q. Using your definitions from above, determine the measure of the arc in the USA TODAY Snapshot “Coming clean about showering time” for those that responded five to 10 minutes and for those that responded less than five minutes?

Cabri Jr. Directions:

- Press **β** and choose Measure>D & Length. Move the pen to the circumference of your circle so that the circumference is moving and press **⏏** to determine the circumference. Move this value to the lower left corner of the screen, placing it next to the letter C. Press **⓪** to stop the measurement tool. Move the pointer to the value for the circumference and press **ρ** to display more decimal places and press **\neq** to display fewer decimal places. Repeat this process to measure the radius of your circle and place the value next to the R in the upper right corner.

Data Source:

Roper Public Affairs and Media survey of 1,007 American adults July 29-31 for Olay Shower Secrets.

Materials:

- TI-83 Plus family or TI-84 Plus family

Coming clean about showering time

Procedure:

Complete the following table using the Calculate feature from the F5 menu.

Degree measure of each central \angle	(Central \angle measure) / 360	Length of each arc
Example: 20°	$20/360 = 0.06$	$0.06 * \text{circumference}$
		Sum = circumference

Find the sum of the last column for the four central angles from the Snapshot. _____

How does this value compare to the circumference of the outer circle?

Activity 2: Use the information from Activity 1 and the USA TODAY Snapshot “Coming clean about showering time” to answer the focus questions.

Q. Each section of the circle graph represents a measurable quantity. What is that quantity?

Q. How many people spend 10 minutes or less in the shower? _____

Q. The USA TODAY Snapshot “Coming clean about showering time” shows that 79% of the respondents spend five to 20 minutes in the shower. What is the measure of the angle (in degrees) formed by these two groups?

Q. What is the measure of the length of the arc formed by the two adjacent arcs?

Q. Identify two concentric circles in the USA TODAY Snapshot “Coming clean about showering time.” How much farther is it around the outer circle? (If the radius of the outer circle is 25 mm and the distance from the outer to the inner circle is 5 mm).

Student Notes: