**Radian Measure**

**Introduction Activity**

1. Construct a circle whose radius is equal

to the length of the piece of string given.

1. Draw in the radius and label it AB.

The center is A and B is on the circle.

1. Using the string, place one end of it at B

and lay it out on the circumference.

Mark C at the end of the string.

1. Join point A to point C with a segment.

The angle created in the center of the circle is called **“1 Radian”.**

**NOTE:** Activities 1 to 4 show how to **construct** an angle of size 1 radian.

1. Using a protractor measure (and write down) the approximate size of this radian in degrees.

Approximate size of 1 radian in degrees = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Using the string **on the circumference** repeat step 4 above until the entire circumference has been covered.
2. From the work you have done on this circle answer the following:
3. Estimate how many radians are in a full circle:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Estimate how many radians are in a semi-circle:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Write down, in your own words, what you understand by the phrase “*An angle of size one radian.”*

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1. Complete the following table, using circles drawn by the members of your table.

|  |  |  |
| --- | --- | --- |
| **Circle** | **Radius** | **Estimation of 1 radian** |
| Circle 1\* |  |  |
| Circle 2 |  |  |
| Circle 3 |  |  |
| Circle 4 |  |  |

\*the circle you constructed at question 1 above.

Based on the table above, what affect does the size of the radius of a circle have on the size of 1

radian?

1. a. From analyzing the work so far, make a connection between the number of radians in a full circle

and the circumference.

b. If is an angle, measured in radians, derive a formula connecting , **(L)** **the length of the arc**, and

**(r) radius**.

1. Using the information generated in the previous question:
2. How many radians are in a full circle correct to two decimal places?\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Show that radians =
4. How many radians are in a semi-circle, correct to two decimal places?\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Using the information generated in question 10 above, show how to calculate the size of 1 radian, correct to one decimal place.
6. Which of the following angles 1, 2, 3, 4, or 5 represent an angle of approximately 4 radians. Explain your answer.
7. Summarize what you have learned about radians from this activity.