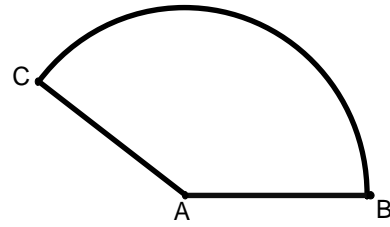


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Use radian measure for all angles on this quiz.

1. This diagram from *Geometer's Sketchpad* shows a sector of a circle and its measurements.



$m \overline{AB} = 2.20 \text{ cm}$
 $m \overline{AC} = 2.20 \text{ cm}$
Length $\widehat{BC} = 5.50 \text{ cm}$

a. Find the radian measure of $\angle A$.

b. Find the area of the sector.

2. Without using a calculator, find the value of $\tan(\frac{11}{3}\pi)$. Give a complete explanation of how you find the value. Include a diagram showing $\frac{11}{3}\pi$ as an angle.

3. If $\cos \theta = -\frac{1}{4}$ and $0 < \theta < \pi$, find the values of the other five trigonometric functions of angle θ . Give exact answers (using square roots as needed), not decimal approximations.

$\sin \theta =$ _____ $\tan \theta =$ _____

$\cot \theta =$ _____ $\sec \theta =$ _____

$\csc \theta =$ _____

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4. For any x , how are $\sin(x)$ and $\sin(-x)$ related? Give a justification of your answer using a circle diagram.

5. Fill in each equation so that it represents the same property as the verbal description.

a. “The sine function is periodic.” $\sin(x) = \sin(\text{_____})$

b. “The sine function is a horizontal translation of the cosine function.” $\sin(x) = \cos(\text{_____})$

6. Suppose that the depth of the water in a harbor is 20 feet at low tide and 30 feet at high tide, and fluctuates in such a way that it can be modeled with a sinusoidal function.

The time interval from a high tide to the next low tide is about 6.2 hours. The time interval from a low tide to the next high tide is also about 6.2 hours.

Let t represent time measured in hours, and suppose that the water is at low tide when $t = 0$. Write a function that models the water depth as a function of time. Also sketch its graph.