

Trigonometry Transformation & Word Problem

Nov 24th, 2023

1. For the following values of $\sin x$, determine the **exact radian value** of x if $0 \leq x \leq 2\pi$.

a) $-\frac{\sqrt{3}}{2}$

b) -1

2. For the following, use related acute angle to write an equivalent expression and then evaluate.

$$\cot\left(-\frac{5\pi}{3}\right) = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

3. Solve the following equations, leave your answer in radian and rounded to 2 decimal places.

a) $\sec x = 1.5$

b) $\tan x = -2.45$

4. Sketch one period of $y = -2\sin\left[\frac{1}{3}\left(x + \frac{\pi}{3}\right)\right] - 3$, answer the following questions, find and label 5 key points.

Describe the steps of transformation from $y = \sin x$:

State the amplitude:

State the equation of axis:

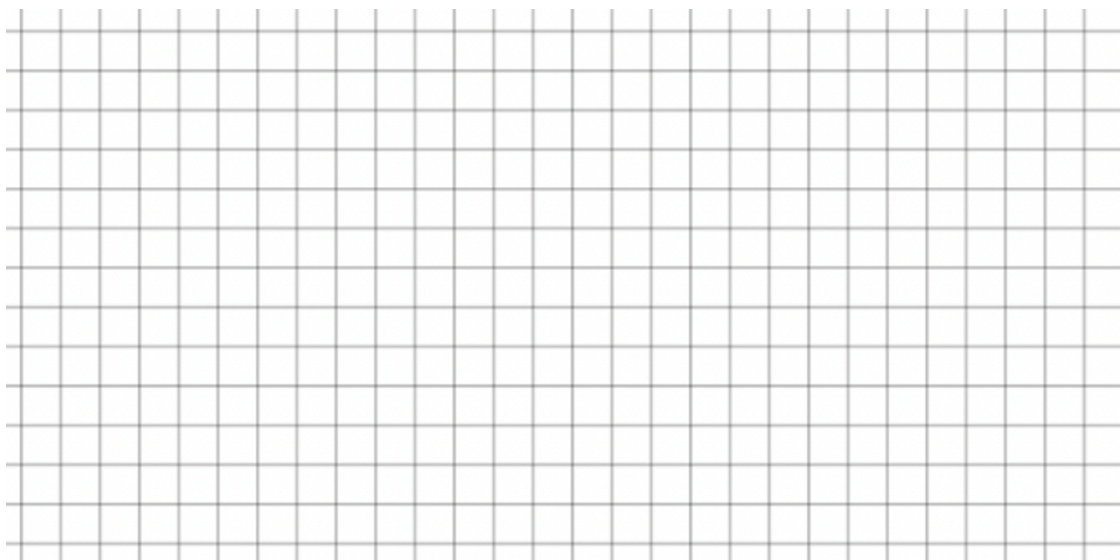
State max:

State min:

Initial point:

Period:

Final point:



5. Each person's blood pressure is different, but there is a range of blood pressure values that is considered healthy. The function $P(t) = -20 \cos\left(\frac{5\pi}{3}t\right) + 100$ where P is blood pressure in millimeters of mercury, t is time in seconds of a person at rest.

a) Sketch the graph from 0 to 3.6 seconds. Label 5 key points for one period.



b) How many times does this person's heart beat each minute, i.e., find period?

c) What is the range of the function? What does it represent?

d) At what time the blood pressure is at 110 from 0 to 3.6 seconds?