Practice Test 2. Unit Circle And Graphs

Text: Ch. 4, 5

Last Name	First Name	Date

This assignment is closed books, closed notes.

All your scratch work will be collected with the test and discarded.

All electronic devices besides trig-capable nongraphing calculators are prohibited.

Fully justify your answers and show all work
in order to maximize your partial credit.

Leave your answers with simplified radicands and fractions in lowest terms.

Do not round anything unless directed.

1 (6 points)**.** Find the radian measure of the given angle, state the answer as a multiple of π.

(a) -25°

(b) 36°

2 (6 points)**.** Find the radian measure of the given angle, state the answer as a decimal rounded to 3 significant digits.

(a) 31.415°

(b) $27^\circ 17' 28''$

3 (9 points)**.** Find the degree measure of the given angle.

(a) $\frac{7}{15}\pi$

(b) $\frac{-21\pi}{4}$

(c) π^2

4 (2 points)**.** Find the radian measure of the angle ϕ if its terminal side contains the point $(-1/2, -\sqrt{3}/2)$ and $-\pi \leq \phi \leq -\pi/2$.

5 (2 points)**.** Find the coordinates of the point where the terminal side of the angle $\psi = 111^\circ$ meets the unit circle. Round your answer to 3 significant digits.

6 (9 points)**.** Find all points on the unit circle corresponding to an angle α with

(a) $\sin\alpha = \frac{1}{2}$

(b) $\cot\alpha$ undefined

(c) $\cos\alpha = \frac{7}{11}$

7 (2 points)**.** Leon spins a merry-go-round by pulling it as he's walking around it at 2 feet per second. Find the angular velocity of the merry-go-round if its radius is 6 feet. State the units of the answer.

8 (2 points)**.** A professional break dancer can headspin at 3.5 full rotations per second. Find the corresponding angular velocity in radians per minute.

9 (6 points)**.** Sports car wheels are 18 inches in diameter, and they are spinning at 176 radians per second.

(a) Find how fast the car is going, and leave your answer in inches per second.

(b) Given that 1 mile is 63360 inches, find the speed of this car in miles per hour.

(c) Find how fast the wheels are turning in terms of full rotations per second. Round your answer to 3 significant digits.

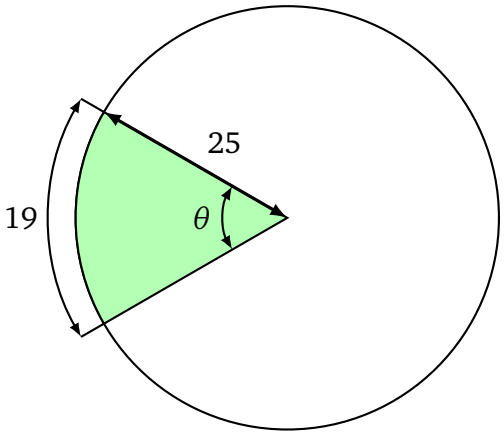
10 (4 points)**.** Bilbo cuts a 12 inch diameter apple-tart into 13 equal sectors to feed the hungry dwarves.

(a) What is the angular measure of each tart sector in radians?

(b) What is the area of each tart sector in square inches? Round your answer to 3 significant digits.

11 (4 points)**.** To make a conical hat, Homer cuts out a sector out of a construction paper, with the 25 inches radius and the length of the arc 19 inches.

(a) Find the angular measure of the sector in radians.

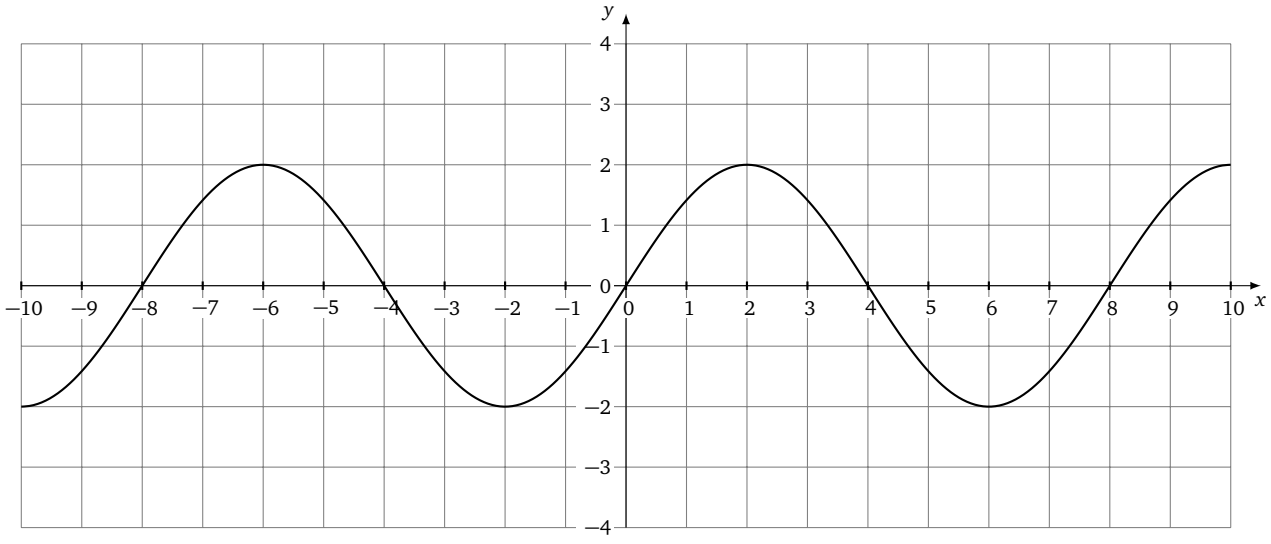


(b) Find the area of the sector.

12 (6 points). Sketch a plot of the function $y(x) = 4\cos(x/5)$. Plot at least one full period, and scale it so that 5 distinct points within that period are located at the grid intersections.

Period: Amplitude:

13 (4 points). Find an expression for the shown trig function.

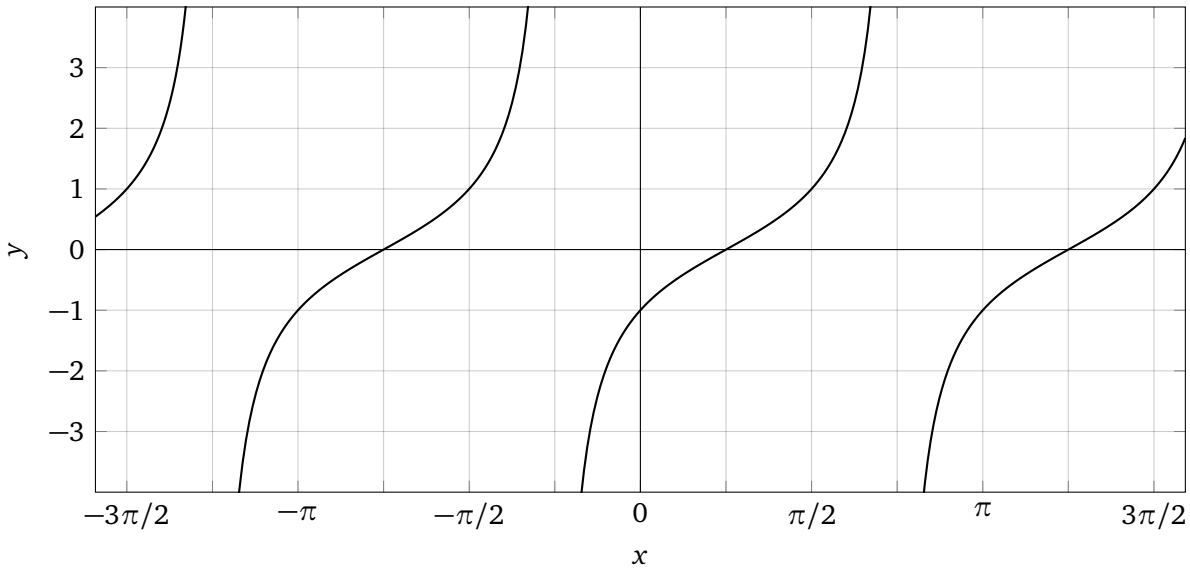


Period: Amplitude: Expression:

14 (6 points). Sketch a plot of the function $y(x) = \csc(\pi x) - 1$. Plot at least one full period, and scale it so that 2 distinct points within that period are located at the grid intersections.

Period: Midline (vertical shift):

15 (4 points). Find an expression for the shown trig function.



Period: Phase Shift: Expression:

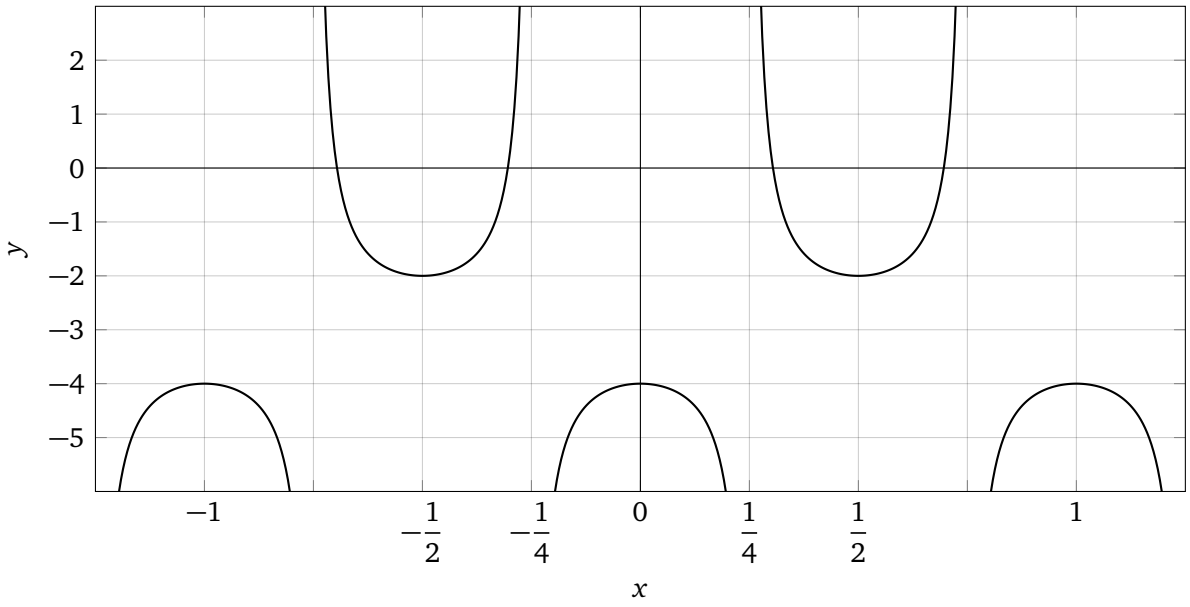
16 (10 points). Sketch a plot of the function:

$$y(x) = 2\sin(4\pi x - \pi) + 2$$

Plot at least one full period, and scale it so that 5 distinct points within that period are located at the grid intersections.

Period: Amplitude: Midline: Phase Shift:

17 (4 points). Find an expression for the shown trig function.



Period: Midline: Phase Shift: Expression:

18 (10 points). Sketch a plot of the function:

$$y(x) = \frac{1}{2}\cot\left(\frac{x}{3} + \frac{2\pi}{3}\right) - 1$$

Plot at least two full periods, and scale them so that 2 distinct points on your graph are located at the grid intersections.

Period: Midline (vertical shift): Phase Shift:

TOTAL POINTS: 96