

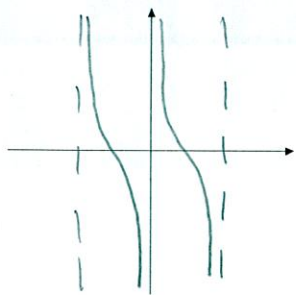
These questions are about the non-sinusoidal trigonometric functions.

SCORE: ____ / 8 PTS

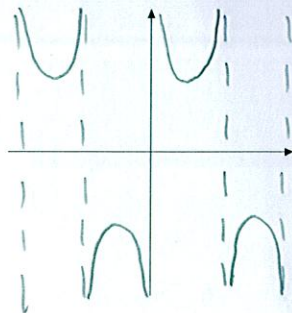
- [a] Sketch 2 periods of the graphs of the following functions.

NOTE: You only need to get the general position and shape correct. Do NOT plot points.

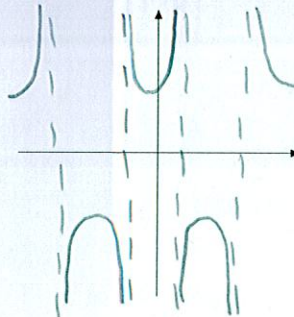
$y = \cot x$



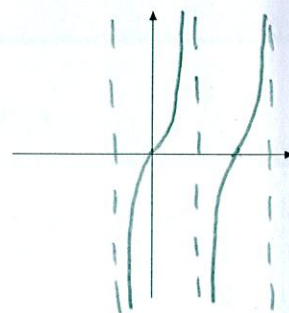
$y = \csc x$



$y = \sec x$



$y = \tan x$



- [b] Fill in the blanks.

[1] As $x \rightarrow \pi^-$, $\cot x \rightarrow -\infty$.

[2] As $x \rightarrow \frac{\pi}{2}^+$, $\sec x \rightarrow -\infty$.

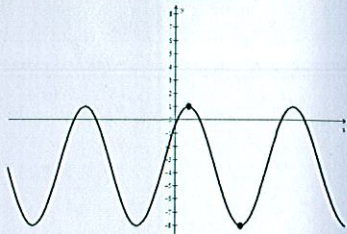
[3] The equations of the vertical asymptotes of $y = \tan x$ are $x = \frac{\pi}{2} + n\pi$.

[4] The domain of $y = \csc x$ is $x \neq n\pi$.

Fill in the blanks regarding the graph on the right. Simplify your answers.

NOTE: The x - coordinates of the two points highlighted are $\frac{\pi}{9}$ and $\frac{5\pi}{9}$.

SCORE: _____ / 7 PTS



[a] Middle y - value = $\frac{-7}{2}$ $\frac{1+(-8)}{2}$

[b] Amplitude = $\frac{9}{2}$ $\frac{1-(-8)}{2}$

[c] Phase shift = $\frac{\pi}{9}$

[d] Period = $\frac{8\pi}{9}$ $\frac{1}{2}P = \frac{5\pi}{9} - \frac{\pi}{9} = \frac{4\pi}{9}$ $\frac{2\pi}{B} = \frac{8\pi}{9} \rightarrow \frac{9}{8\pi} = \frac{4}{8\pi}B$
 $B = \frac{9}{4}$

[e] An equation of the graph is $y = \frac{9}{2} \cos \frac{9}{4} (x - \frac{\pi}{9}) - \frac{7}{2}$ or $\frac{9}{2} \cos (\frac{9}{4}x - \frac{\pi}{4}) - \frac{7}{2}$

Let $y = -5\sin(\frac{\pi}{6}x + \frac{5\pi}{3}) + 2$.

SCORE: ____ / 15 PTS

- [a] Fill in the blanks. Simplify your answers.

Middle y - value = 2

Amplitude = 5

$| -5 |$

Maximum y - value = 7 $2+5$

Period = 12

$\frac{2\pi}{\frac{\pi}{6}} = 2\pi \cdot \frac{6}{\pi}$

Minimum y - value = -3 $2-5$

Phase shift = -10

$\frac{\pi}{6}x + \frac{5\pi}{3} = 0$

- [b] Find the coordinates for all points corresponding to the middle, top and bottom of the graph of the function for 2 complete cycles, starting at the phase shift.

Point 1: (-10 , 2)

$\frac{1}{4}P = 3$

Point 2: (-7 , -3)

Point 6: (5 , -3)

Point 3: (-4 , 2)

Point 7: (8 , 2)

Point 4: (-1 , 7)

Point 8: (11 , 7)

Point 5: (2 , 2)

Point 9: (14 , 2)

$\frac{\pi}{6}x = -\frac{5\pi}{3}$

$x = -\frac{5\pi}{3} \cdot \frac{6}{\pi}$

- [c] On the graph paper below, sketch a detailed graph of 2 complete cycles of the function using the information from [b]. You must label all x - and y - values from [b] on the appropriate axes below, and you must use a consistent scale for each axis. **You do NOT need to label each tick mark on each axis, only the ones you found in [b].**

- [d] Also on the graph paper below, sketch the graph of $y = -5\csc(\frac{\pi}{6}x + \frac{5\pi}{3}) + 2$.

