

Math 130 - Quiz 4

September 18, 2019

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary. You must work individually on this quiz. This quiz is due September 23.

1. (3 points) Determine the locations of all asymptotes of the graph of $y = -2 + 5 \tan(2x - \frac{\pi}{3})$:

ASYMPTOTES SATISFY

$$2x - \frac{\pi}{3} = \frac{k\pi}{2} \text{ WHERE } k \text{ IS ANY ODD INTEGER.}$$

$$2x = \frac{k\pi}{2} + \frac{\pi}{3} = \frac{3k\pi + 2\pi}{6}$$

$$x = \frac{3k\pi + 2\pi}{12} = \frac{(3k+2)\pi}{12} \text{ WHERE } k \text{ IS AN ODD INTEGER}$$

$$\dots, -\frac{\pi}{12}, \frac{5\pi}{12}, \frac{11\pi}{12}, \dots$$

2. (6 points) On the attached graph paper, carefully sketch the graph of $y = \cot(3x + \frac{\pi}{4})$. Clearly label your axes and the asymptotes.

START WITH $y = \tan(3x + \frac{\pi}{4})$. GRAPH VERY LIGHTLY.

ASYMPTOTES...

$$3x + \frac{\pi}{4} = \frac{k\pi}{2}, k \text{ ODD}$$

$$3x = \frac{2k\pi - \pi}{4}$$

$$x = \frac{(2k-1)\pi}{12}$$

$$\text{ASYMPTOTES } -\frac{3\pi}{12}, \frac{\pi}{12}, \frac{5\pi}{12}, \dots$$

3. (6 points) On the attached graph paper, carefully sketch the graph of $y = 1 + 2 \csc(2x - \frac{\pi}{2})$. Clearly label your axes and the asymptotes.

START WITH THE GRAPH OF $y = 1 + 2 \sin(2x - \frac{\pi}{2})$
 $1 + 2 \sin 2(x - \frac{\pi}{4})$

AMPLITUDE 2

PERIOD π

PHASE SHIFT $\frac{\pi}{4}$ RIGHT

#2

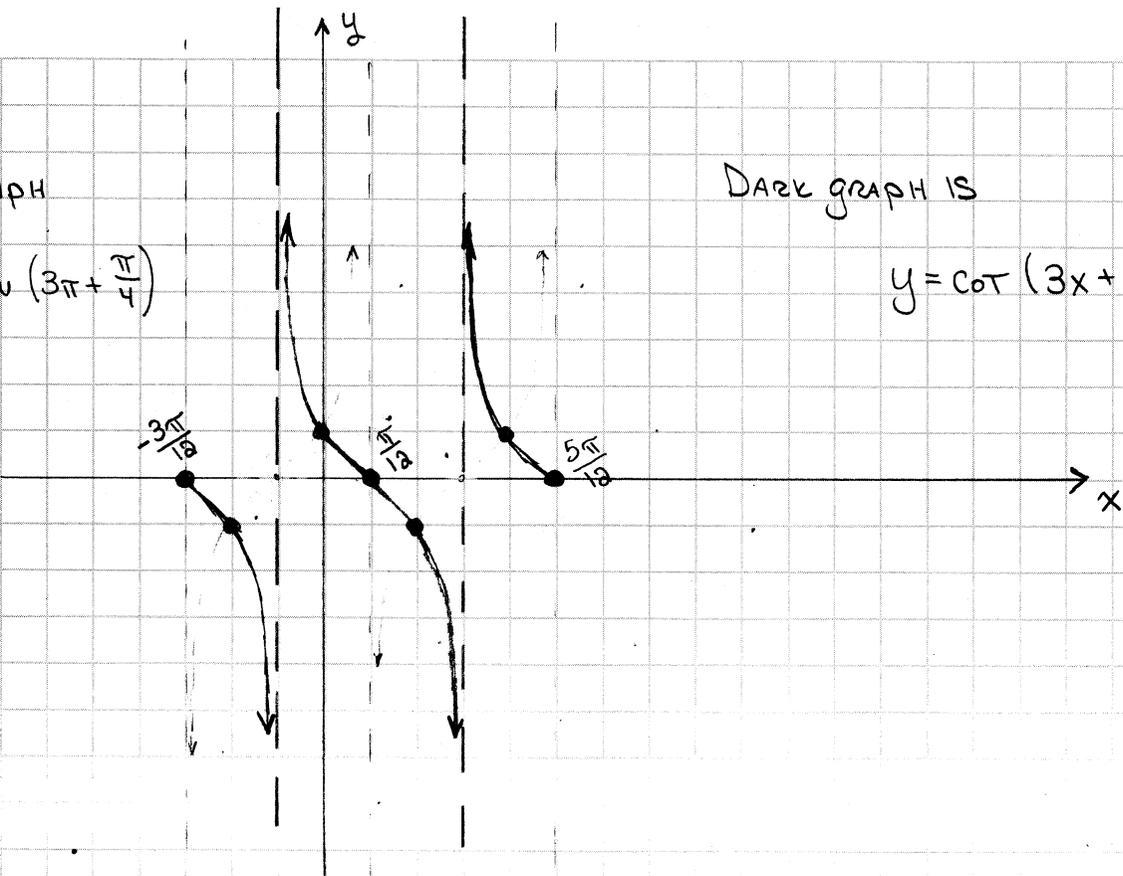
Light graph

is

$$y = \tan\left(3x + \frac{\pi}{4}\right)$$

Dark graph is

$$y = \cot\left(3x + \frac{\pi}{4}\right)$$



#3

Light graph

is

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

Dark graph

is

$$1 + 2\csc\left(2x - \frac{\pi}{2}\right)$$

