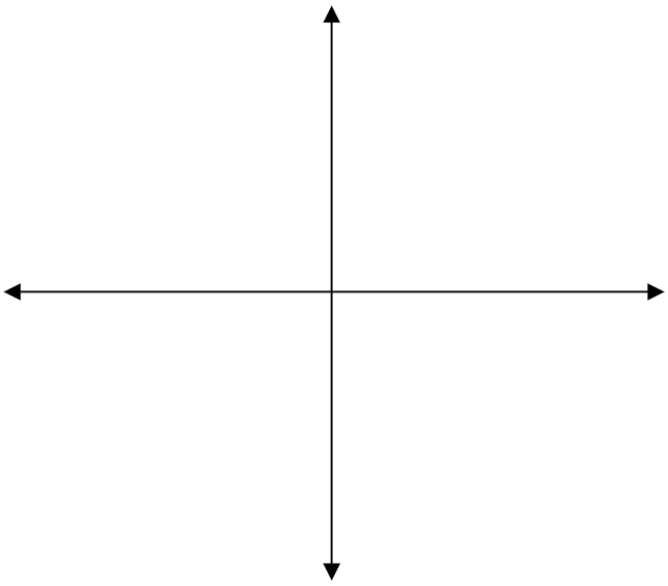
Name:_____ Date:_____

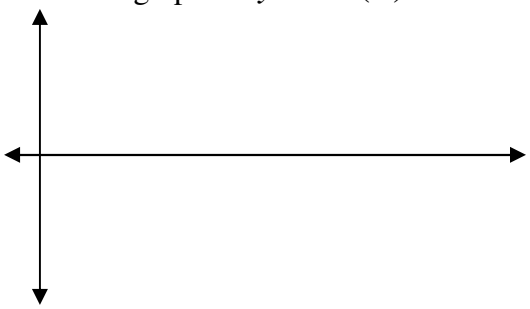
Mr. Carman Algebra 2/Trig H: Graphing $y = \tan(\theta)$

DO NOW: (Review) Fill in these diagrams.

The Unit Circle



Sketch the graph of $y = \sin(\theta)$ from $0 \le \theta \le 2\pi$



Sketch the graph of $y = \cos(\theta)$ from $0 \le \theta \le 2\pi$

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1) From $0 \le \theta \le 2\pi$, where is $\tan(\theta) = 0$? (Use the unit circle)

2) From $0 \le \theta \le 2\pi$, where is $\tan(\theta)$ **undefined**? (Use the unit circle)

3) What happens to $\tan(\theta)$ when θ approaches $\frac{\pi}{2}$ from the left?

4) What happens to $\tan(\theta)$ when θ approaches $\frac{\pi}{2}$ from the right?

5) What happens to $\tan(\theta)$ when θ approaches $\frac{3\pi}{2}$ from the left?

6) What happens to $\tan(\theta)$ when θ approaches $\frac{3\pi}{2}$ from the right?

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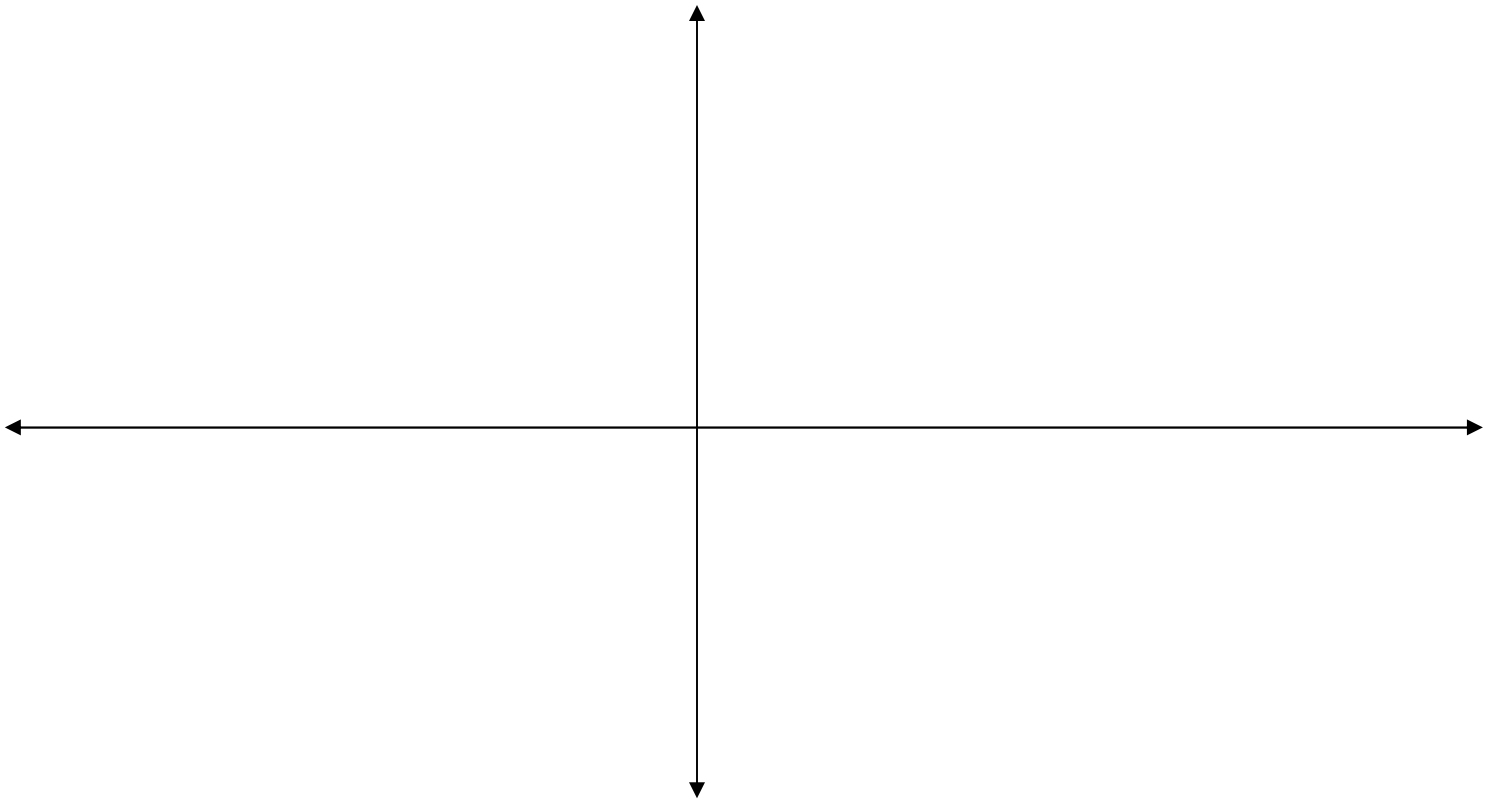
7) Use page 1 to help you complete a sketch of $y = \tan(\theta)$ over the interval $0 \le \theta \le 2\pi$.
Label the **asymptotes**.

8) Sketch $y = \tan(\theta)$ over the interval $-2\pi \le \theta \le 2\pi$. Label the **asymptotes**.



9) What is the period of $y = \tan(x)$?

10) What is the **domain** of $y = \tan(x)$?

11) What is the **range** of $y = \tan(x)$?

12) What is the **domain** of $y = \sin(x)$?

13) What is the **range** of $y = \sin(x)$?

14) What is the **domain** of $y = \cos(x)$?

15) What is the **range** of $y = \cos(x)$?

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16) In which quadrant(s) is $y = \sin(\theta)$ increasing?

17) In which quadrant(s) is $y = \sin(\theta)$ decreasing?

18) In which quadrant(s) is $y = \cos(\theta)$ increasing?

19) In which quadrant(s) is $y = \cos(\theta)$ decreasing?

20) Which is *not* an element of the domain of $y = \tan(x)$?

(1) π (2) 2π (3) $\frac{\pi}{2}$ (4) $-\pi$

21) If the period of $y = \sin bx$ is $\frac{\pi}{2}$, state a possible value of *b*.

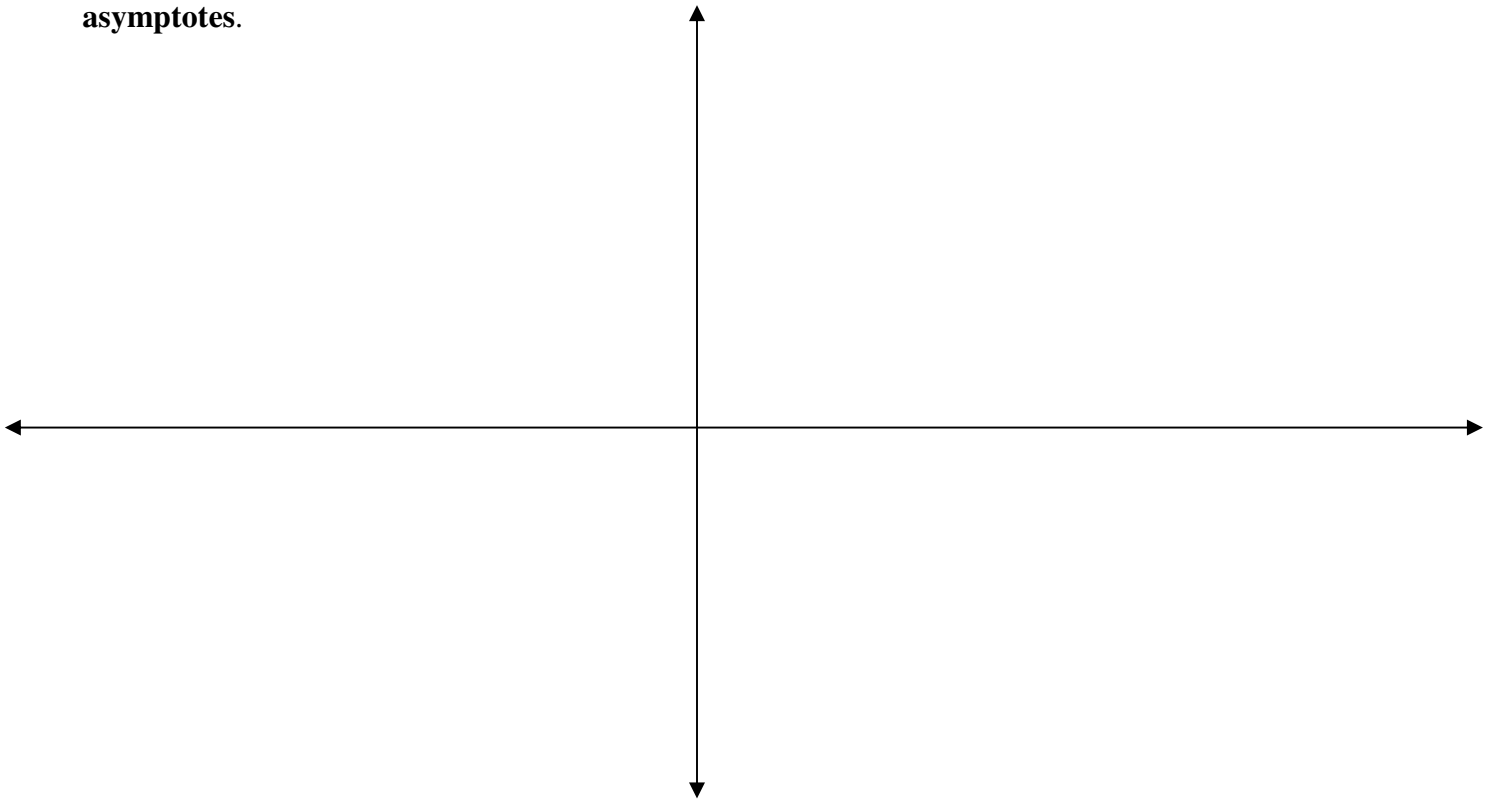
22) State the amplitude, frequency, period, and phase shift of the function: $y = 2\sin 4\left(x - \frac{\pi}{6}\right)$

23) State the amplitude, frequency, period, and phase shift of the function: $y = \frac{1}{3}\sin(3x + \pi)$

24) State the amplitude, frequency, period, and phase shift of the function: $y = 0.5\sin(4x - 7\pi)$

25) State the amplitude, frequency, period, and phase shift of the function: $y = 12\sin\left(\frac{x}{4} + \pi\right)$

26) Sketch the graph of $y = \tan(x)$ over the interval $-2\pi \le x \le 2\pi$ 3 times, and **label its asymptotes**.



Hmm… Make sure you complete these graphs with **quality craftsmanship**.