Name:_____ Hour: _____ Date: _____

NOTES: Section 14.1 – Graph Sine, Cosine, and Tangent Functions

Goals: #1 - I can graph $y = \sin x$ and $y = \cos x$

#2 - I can identify the function's domain, range, amplitude, cycle, period, x-intercepts, and y-intercepts

#3 - I can graph $y = \tan x$

#4 - I can identify the function's domain, range, vertical asymptotes, cycle, period, x-intercepts, and y-intercepts

Homework: Lesson 14.1 Worksheet

Warm Up:

1. Solve ΔABC. Round answers to the nearest <u>tenth</u>.
   a. $B = 77°, a = 25, c = 35$
   b. $a = 45, b = 56, c = 78$

2. What is the area of a triangular banner with sides of length 28 cm, 35 cm, and 47 cm?

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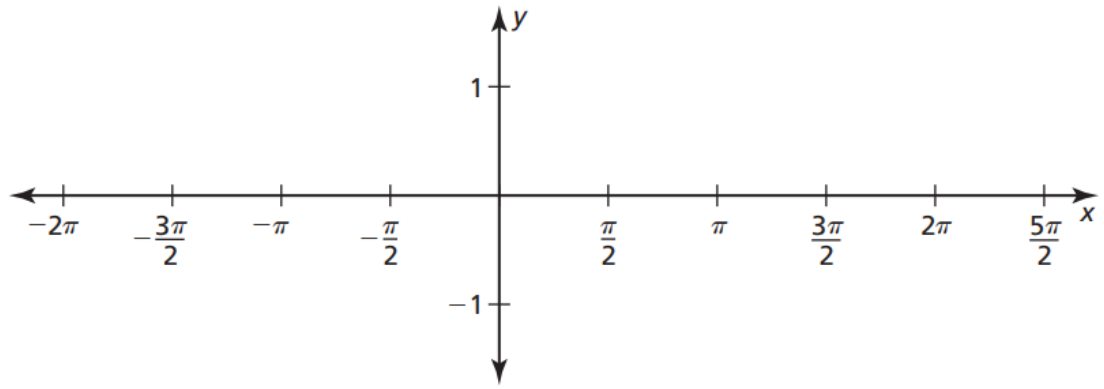
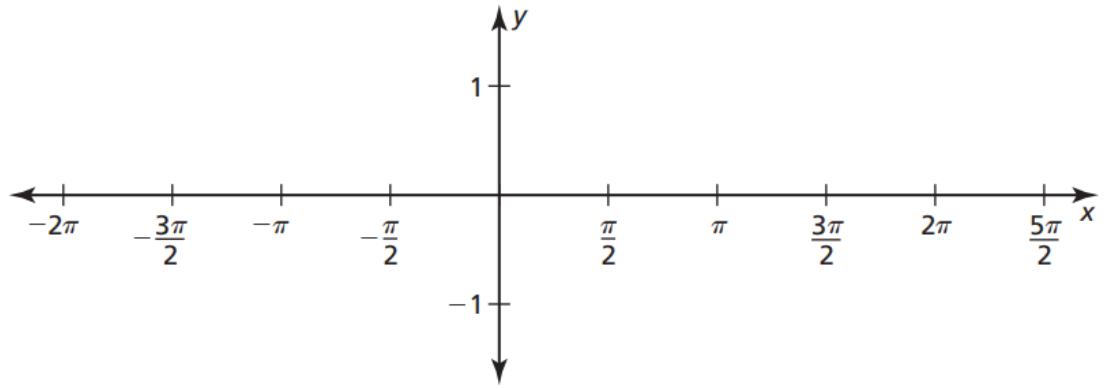
Exploration #1:

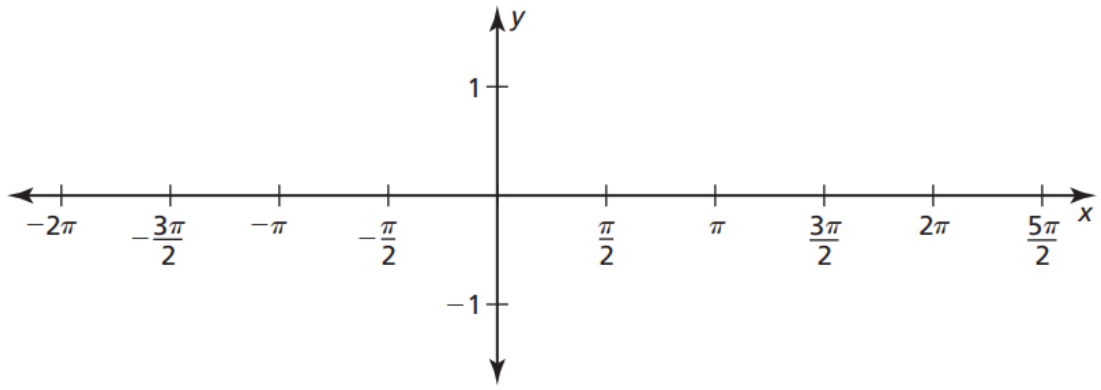
1. Sketch the general curve that the ORANGE DOT is making. Try and be precise!



2. Sketch the general curve that the PURPLE DOT is making. Try and be precise!



3. Sketch the general curve that the RED DOT is making. Try and be precise!



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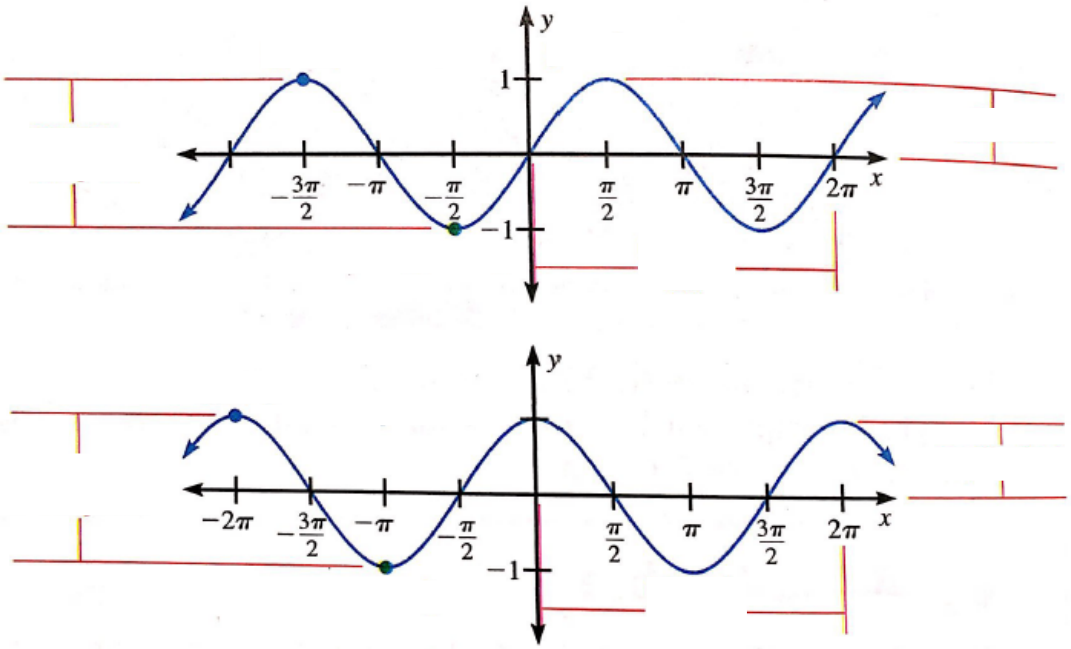
Notes:



Characteristics of $y = \sin x$ and $y = \cos x$:

- The _____ of each function is _____.
- The _____ of each function is _____.
    - Therefore, the _____ value is _____.
    - And the _____ value is _____.
- The _____ of each function's graph is _____ the difference of the _____ and the _____.
- Each function is _____, meaning it has a repeating pattern.
    - The shortest repeating portion of the graph is called the _____.
    - The horizontal length of each cycle is called the _____.
    - Each graph shown above has a period of _____.
- The x-intercepts for $y = \sin x$ occur when _____.
- The x-intercepts for $y = \cos x$ occur when _____.

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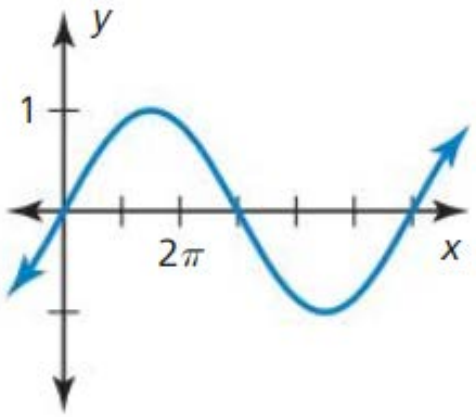
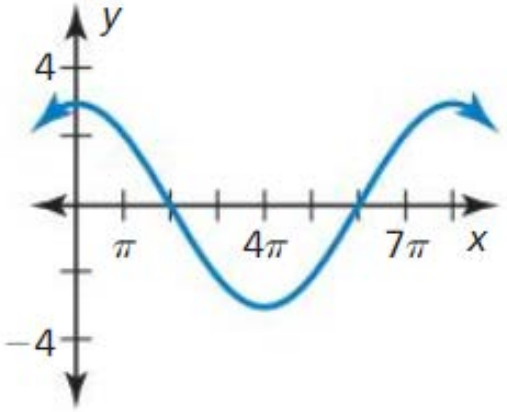
Example #1: Identify the amplitude and the period of the following functions.

1.



2.



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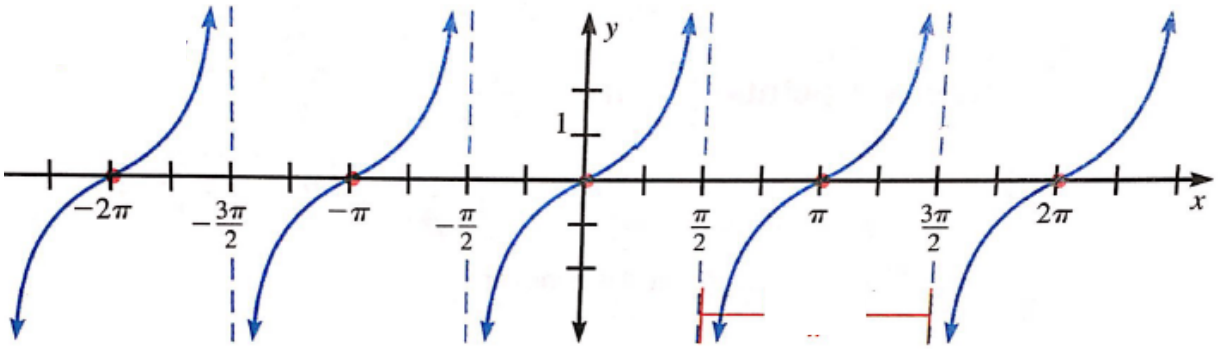

Characteristics of $y = \tan x$:

- The _____ of each function is _____.
  - At these x-values, the graph has _____.
- The _____ of each function is _____.
  - Therefore, there is no _____ value, _____ value, or _____.
- The graph has a period of _____.
- The x-intercepts for $y = \tan x$ occur when _____.

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$$y = a \sin bx$$

$$y = a \cos bx$$

To _____ the above functions, we will look at the

_____ and the _____ of the function.

_____:

_____:

$$y = a \tan bx$$

To _____ the above function, we will look at the

_____ and the _____ of the function.

_____:

_____:

Example #2: Identify the function's amplitude or vertical asymptote and period.

1. $y = 3 \cos\left(\frac{1}{2}x\right)$

amplitude: period:

2. $y = 2 \tan(2x)$

asymptotes: period:

You practice: Identify the function's amplitude or vertical asymptote and period.

1. $y = 2 \sin(4x)$

amplitude: period:

2. $y = 4 \tan\left(\frac{1}{2}x\right)$

asymptotes: period:

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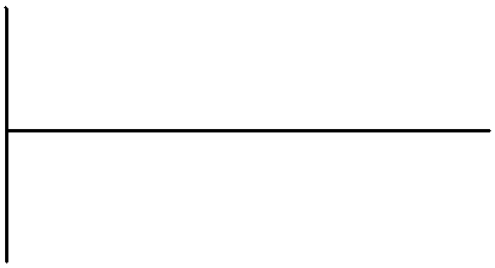
Example #1: Graph <u>one period</u> of the function. Identify its domain, range, amplitude, period, and x- and y-intercepts.

1. $y = 4\sin x$

domain: range:

amplitude: period:

x-int: y-int:

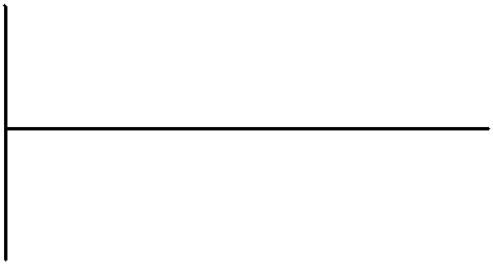


2. $y = \frac{1}{2}\cos 2\pi x$

domain: range:

amplitude: period:

x-int: y-int:



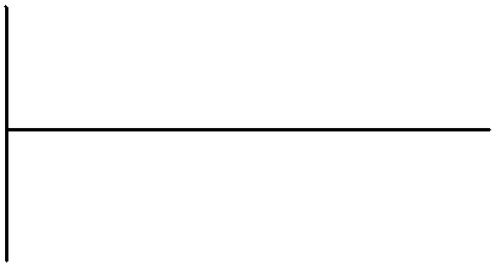
You practice: Graph <u>one period</u> of the function. Identify its domain, range, amplitude, period, and x- and y-intercepts.

1. $y = \frac{1}{4}\sin \pi x$

domain: range:

amplitude: period:

x-int: y-int:



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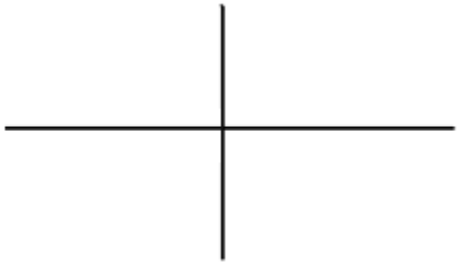
Example #2: Graph <u>one period</u> of the function. Identify its domain, range, amplitude, period, and x- and y-intercepts.

1. $y = 2\tan 3x$



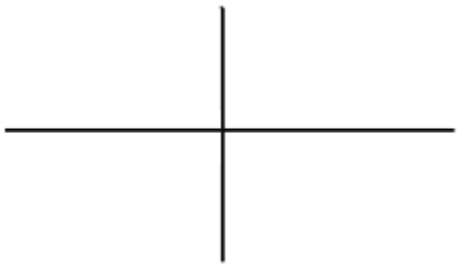
domain: range:

asymptotes: period:

x-int: y-int:

You practice: Graph <u>one period</u> of the function. Identify its domain, range, amplitude, period, and x- and y-intercepts.

1. $y = \tan 4x$



domain: range:

asymptotes: period:

x-int: y-int: