Name: _____

# Ch. 7 Review

Topics that will be covered on the test:

-Graphs of sine, cosine, and tangent functions.

- Know how to graph them on a blank coordinate grid.
- Know how to find the amplitude, period, and range of the function.
- Be able to restrict the graph to specific intervals.
- Know the values that will lie on your x-axis when graphing.
- Show defining features in the graph.

-Even and odd functions

-Determine the Domain and Range of a function.

-Cosecant, Secant, and cotangent Graphs

- Know the domain and range of a cosecant, secant, and cotangent graph.
- Know that these graphs should look like.
- Know how these graphs relate to sine, cosine, and tangent.
- Know how to find the asymptotes that result.

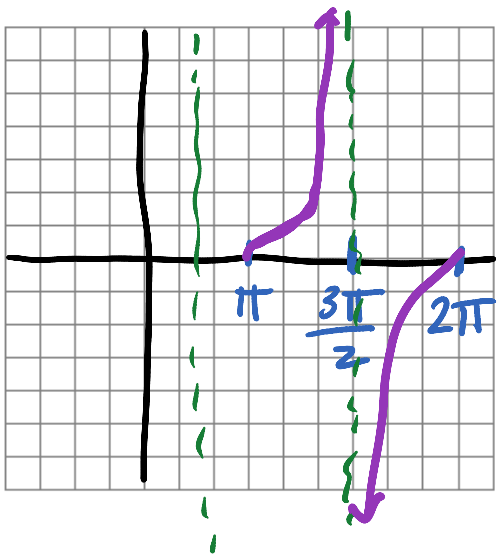
-Transformations for all the trigonometric functions

- Be able to recognize transformations in a function.
- Be able to make a function, given a few transformations.
- Be able to look at a graph, and state the function.
- Be able to create an accurate graph, given a function.

1. Graph $h(t) = tant$ on the interval $[\pi, 2\pi]$.

Asymptotes: $\frac{3\pi}{2}$ (also $\frac{\pi}{2}$)

$\tan = \frac{\sin}{\cos}$ $\cos \Rightarrow 0$




2. What is the minimum value of $g(t) = sint$?

Range: $[-1, 1]$

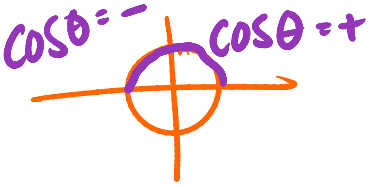
minimum = $-1$

3. For what values of $t$ on the interval $[-3\pi, -\pi]$ is $g(t) = cost$ decreasing?

cost is decreasing when cost moves from positive to negative.

first quad (+) → second quad (-)

$-2\pi \leq t \leq -\pi$ ← This is the only interval between $[-3\pi, -\pi]$




a.) For what values of $t$ on the interval $[-2\pi, 2\pi]$ is tan $t$ less than 0?

tant is less than 0 when tant is negative.

→ $\tan t = \frac{\sin t}{\cos t}$

tant is negative in 2nd & 4th quad

$\frac{\pi}{2} < t < \pi, \quad \frac{3\pi}{2} < t < 2\pi$

$-\frac{3\pi}{2} < t < -\pi, \quad -\frac{\pi}{2} < t < 0$

**Describe the transformations that change the original inverse trigonometric or trigonometric graphs. Provide the period and amplitude as well.**

4. $g(t) = \sec(-t) - 8$

→ Reflection over the y-axis

→ down 8

Amplitude: 1

Period: $\frac{2\pi}{1} = 2\pi$

5. $f(t) = 4cost + 5$

→ Vertical stretch by 4
→ up 5

Period: $2\pi$
Amplitude: 4

6. $h(t) = 5\cos(t - 3)$

→ phase shift: Right 3
→ Vertical Stretch by 5

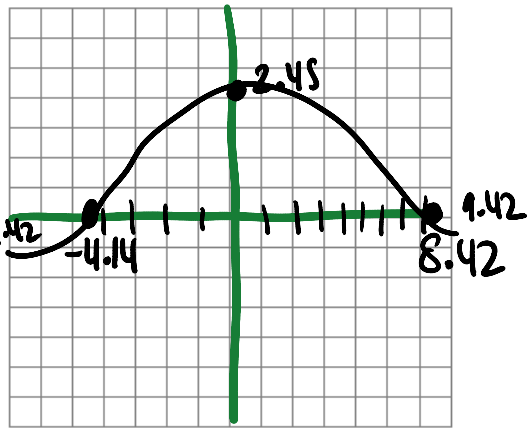
- Period: $2\pi$
- Amplitude: 5

7. $g(t) = 2\cos(3t - 4) - 1$

→ horizontal compression $1/3$
→ horizontal shift: right $4/3$
→ Vertical Stretch by 2
→ down 1

Period: $\frac{2\pi}{3}$ Amplitude: 2

8. Identify the amplitude, period, vertical shift, and phase shift of $h(t) = -2sin\left(\frac{t}{3} + 4\right) + 1$. Then graph this function from $[-3\pi, 3\pi]$.




Amp: 2 period: $\frac{2\pi}{1/3} = 6\pi$

→ horizontal Stretch by 3
→ horizontal Shift: left 12
→ Vertical Stretch by 2
→ Reflection over the X-axis
→ up 1
→ Using Your Graphing Calculator!

9. Find a sine function whose graph looks like the graph of:

$f(t) = 3\sin(2t - 1) + 4\cos(2t + 3)$.

After graphed on a graphing calculator:

Amplitude $\approx$ 2.61 Phase shift $\approx$ .29.

Period: $\frac{2\pi}{2} = \pi$ $b = 2$

$g(t) \approx 2.61 \sin(2(t - .29))$

$g(t) \approx 2.61 \sin(2t - .58)$

either are accepted!

10. Find a sine function whose graph looks like the graph of:

$f(t) = 6\sin(4t + 7) - 5\cos(4t + 8)$

After graphed on Calc:

Amplitude $\approx$ 10.56 Phase shift $\approx$ .1145 left

Period: $\frac{2\pi}{4} = \frac{\pi}{2}$

$g(t) \approx 10.56 \sin(4(t + .1145))$

$g(t) \approx 10.56 \sin(4t + .458)$

11. State the sine function with the given amplitude, period, phase shift, and vertical shift.

$6, \frac{5\pi}{3}, 0, -1$ $f(t) = 6\sin(6/5t) - 1$

$\frac{5\pi}{3} = \frac{2\pi}{b}$

$b = \frac{2\pi \cdot 3}{5\pi}$

$b = 6/5$

$\frac{2}{3}, 3\pi, -\frac{2\pi}{3}, -2$

$g(t) = 2/3 \sin(2/3(t + \frac{2\pi}{3})) - 2$

$g(t) = 2/3 \sin(2/3t + \frac{4\pi}{9}) - 2$

$b = 2/3$

12. Find **all** the exact $t$-values for which $\tan t = -\frac{\sqrt{3}}{3}$.

$t = \frac{5\pi}{6} + n\pi$ where n is any integer

$\tan t = \frac{\sin t}{\cos t}$ ← where does this equal $-\frac{\sqrt{3}}{3}$

either 2nd or 4th quad.

$\frac{5\pi}{6}$ & $\frac{11\pi}{6}$ within 1 cycle of unit circle!

13. Find **all** the exact $t$-values for which $\sin t = \frac{\sqrt{2}}{2}$.

sin t is positive in the 1st & 2nd quadrant.

$\frac{\pi}{4}$ will produce $\frac{\sqrt{2}}{2}$

$\frac{3\pi}{4}$ ↗

$\frac{\pi}{4} + 2\pi n$ where n is an integer

or $\frac{3\pi}{4} + 2\pi n$ where n is an integer.

14. Graph $g(t) = 2\sin\left(\frac{2t}{3} - \frac{\pi}{9}\right)$ over the interval $[-2\pi, 2\pi]$.

→ horizontal stretch by 3/2

→ horizontal shift: right $\frac{3\pi}{18}$

→ Vertical shift by 2

→ Graph w/ Calculator!