

Warm-up!

A) Solve the inequality:

$$(x - 2)^2(x + 3)(x - 5)^3 \leq 0$$

B) Solve over the interval $0 \leq \theta < 2\pi$

$$\sin \theta = -\frac{1}{4}$$

C) Solve over the interval $0 \leq \theta < 2\pi$

$$\cot \theta = \frac{2}{3}$$

Periodic Graphs Day 8:

- Trig Inequalities (3.10)
- Calculator Skills

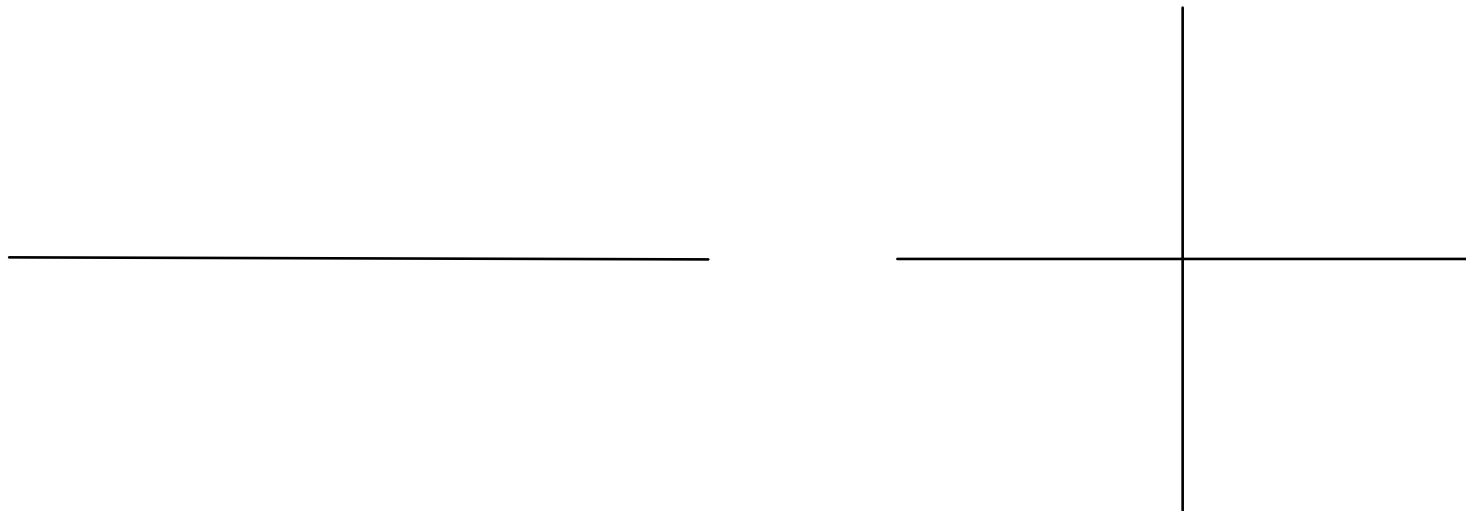
Homework: Trigonometric Inequalities

Quiz Next Class:

- An FRQ #3 style question
- Graphs of tan/cot/sec/csc
- Solving Trig Equations using Inverse Trig
- Solving Inverse Trig Equations
- Evaluating Inverse Trig Expressions

Example 1

Let $f(\theta) = 3 \cos \theta + 2$. Over the interval $0 \leq \theta \leq 2\pi$, where is $f(\theta)$ positive?



Strategy for All Inequality Problems

1. Move everything to one side and solve the equality
2. Put zeros on number line
3. Test regions

Example 2

Let $f(\theta) = (\sin \theta - 1)(5 \cos \theta - 2)$.

Over the interval $-2\pi \leq \theta \leq 0$, where is $f(\theta)$ negative?

Example 3

Solve over the interval $0 \leq \theta \leq 2\pi$

$$3 \sin^2 \theta + 4 \sin \theta - 4 \geq 0$$

Example 4 (When we finish this question, remind me I want to check it a different way)

Solve over the interval $0 \leq \theta \leq 2\pi$

$$6 \sin^2 \theta + \cos \theta > 5$$

Example 5

What are all values of θ in $0 \leq \theta \leq 2\pi$ for which $\cos \theta \geq 0$ and $\sin \theta \geq -\frac{1}{2}$

Example 6

What are all values of θ in $0 \leq \theta \leq 2\pi$ for which $\sin \theta < \frac{1}{2}$ and $-2 \sin \theta < \sqrt{3}$

Example 7

Solve over the interval $0 \leq \theta \leq 2\pi$

$$(2 \sin \theta + 1)(\sin \theta + 2)(3 \sin \theta - 1) \geq 0$$

Example 8

Solve over the interval $0 \leq \theta \leq 2\pi$

$$9 \cos^2 \theta < 1$$

Example 9

Let $f(x) = 3 \sin\left(\frac{\pi}{8}(x - 1)\right) + 5$ for $0 \leq x \leq 15$

Use a graphing utility to analyze the graph of $y = f(x)$ to determine an interval over which $f(x) > 6$.