

## Section 7.1 Vertical Shift and Phase Shift

Day 1

### Trig Identity Notes

Identity is Defined As:

- A statement of equality that is always true
- X values that disprove an identity are called counter-examples.
- Use a graphing calculator to see if it is an identity and to find counter-examples.

#### Rules:

$$\sin x = 1/\csc x$$

$$\csc x = 1/\sin x$$

$$\cos x = 1/\sec x$$

$$\sec x = 1/\cos x$$

$$\tan x = 1/\cot x$$

$$\cot x = 1/\tan x$$

$$\tan x = (\sin x) / (\cos x)$$

$$\cot x = (\cos x) / (\sin x)$$

**Assignment:** none

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## Section 7.1 Vertical Shift and Phase Shift

Day 2

### Pythagorean Identities

$$\sin^2 x + \cos^2 x = 1$$

$$\tan^2 x + 1 = \sec^2 x$$

$$1 + \cot^2 x = \csc^2 x$$

Proof: think of an ordered pair on the unit circle (x, y)

Memorizing – start with sine and cosine.

**Assignment:** finish 7-1A

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## Section 7.1 Vertical Shift and Phase Shift

Day 3

### Opposite Angle Identities

$$\sin(-x) = -\sin x$$

$$\cos(-x) = \cos x$$

Example: simplify  $\sin(-\pi/6) + \cos^2(-7\pi/4)$

Proof: think of an ordered pair on the unit circle (x, y)

Memorizing – start with sine and cosine.

### **Strategy 1 for Simplification: use O, H, and A**

- Replace all trig functions with O, H, and A.
- Simplify what is left and switch back to the trig function
- This works for simple problems, not always if functions are squared or for other complex operations

### **Strategy 2 for Simplification: use sine and cosine**

- Look for Pythagorean Identities (sometimes this requires factoring).
- Change all trig functions to an equivalent that uses sine or cosine.
- Eliminate all Denominators through multiplication.
- Evaluate powers (FOIL) or factor
- Add rational functions (fractions)
- At each step consider if it looks similar to a Pythagorean Identity (factor??)
- Consider finding a common denominator to add fractions.

**Assignment:** finish 7-1B

## **Section 7.2 Trig Identity Proofs**

**Day 1**

### **Strategies for Proof:**

- Use the strategies described above.
- You are done when the left and right are exactly the same.
  - Change the left to look like the right.
  - Change them both to the same thing.
- Consider cross-multiplying

**Assignment:** finish 7-2A

tomorrow finish 7-2B

then 7-2C