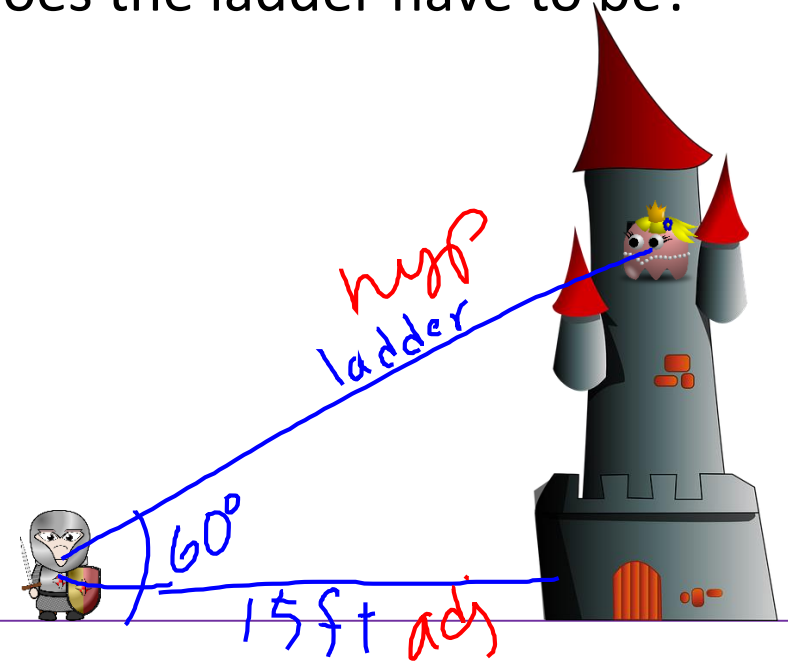# Friday, March 22, 2019

- Warm-up
  - A damsel is in distress and is being held captive in a tower. Her knight in shining armor is on the ground below with a ladder. When the knight stands 15 feet from the base of the tower and looks up at his precious damsel, the angle of elevation to her window is 60 degrees. How long does the ladder have to be?

$$\frac{h \cdot \cos(60)}{\cos(60)} = \frac{\frac{15}{h}}{\cos(60)}$$

$$h = 30ft$$

hyp
ladder
$60°$
15ft adj

- More with sine & cosine waves

One more term

sin

- Amplitude $y = 3\sin x$
- **Period** how long it takes to complete a cycle

standard 2π

- Vertical Shift $y = \sin x + k$
- Horizontal Shift $y = \sin(x - h)$
  phase shift
- **Frequency** how many cycles happen in 2π

$$y = \sin(fx)$$
$$y = \sin(2x)$$

$\sin = y$

$y = A \sin fx + k$

desmos

- look at graph & determine
  - initial wave (sine/cosine)
  - amplitude
  - vertical shift
  - horizontal shift
  - frequency
  - period

Student.desmos.com

4KU 7FY
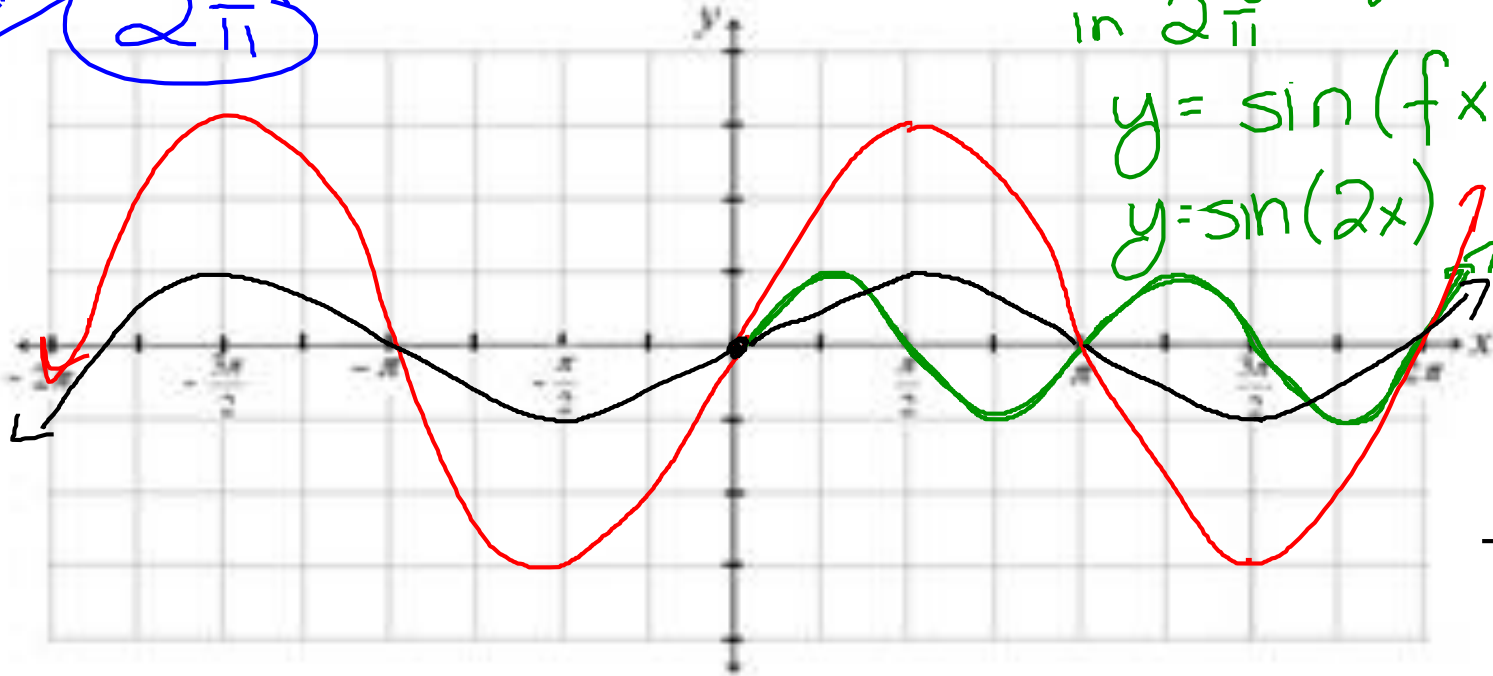
Objectives

Content: I will <u>understand</u> the shape and critical features of **sine** and **cosine waves**.

Social: I will <u>listen</u> well and <u>discuss</u> my uncertainties with my group members.

Language: I will clearly <u>compare and contrast</u> the critical features of **sine** and **cosine waves** as well as <u>apply</u> **amplitude, vertical & horizontal shift, frequency & period**.