Algebra 2

10-06 Modeling with Trigonometric Functions

- Trigonometric functions are _____
- Useful for modeling _____ motions or _____ patterns
- Period (T)
  - Time of _____
  - Unit: _____
- Frequency (f)
  - Cycles per _____
  - Unit: _____

$$T = \frac{1}{f}$$

Find the frequency

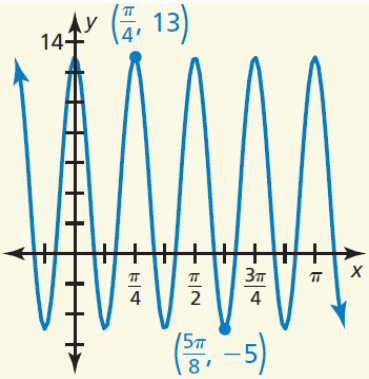
$y = 2\cos 3x$ $y = \sin 3\pi x$

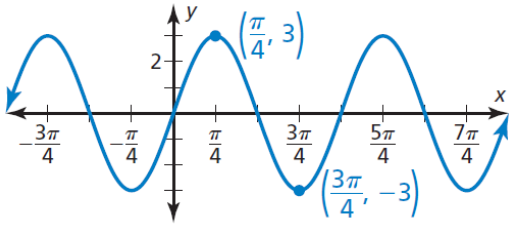
Write Trigonometric Models

1. Find the _____(_____of max and min)
2. Find the _____
3. Find the _____
4. If the situation starts at zero, use _____
   a. If starts increasing _____
   b. If starts decreasing _____
5. If the situation starts at a maximum or minimum use _____
   a. If starts at max _____
   b. If starts at min _____

An audiometer produces a pure tone with a frequency f of 1000 hertz (cycles per second). The maximum pressure P produced by the tone is 20 millipascals. Write a sine model that gives the pressure P as a function of the time t (in seconds).

Write a function for the sinusoid shown.





Two people swing jump ropes. The highest point of the middle of each rope is 80 inches above the ground and the lowest point is 2 inches above the ground. Each rope makes 2 revolutions per second. Write a model for the height h (in inches) of one of the ropes as a function of the time t (in seconds) given that the rope is at its lowest point when $t = 0$.

The tables show the average monthly low temperatures D (in degrees Fahrenheit) in Erie, Pennsylvania, where $t = 1$ represents January. Write a model that gives D as a function of t and interpret the period of its graph. Use technology.

t	D
1	21
2	21
3	28
4	38
5	48
6	58

t	D
7	64
8	62
9	56
10	45
11	37
12	27

568 #1, 3, 5, 7, 9, 11, 12, 13, 15, 17, 19, 20, 21, 23, 25, 32, 33, 37, 45, 47 = 20