	Construct a sinusoid with the given amplitude and period that goes through the given point. A) Amp: 4, period 4π , point (0, 0) B) Amp: 2.5, period $\frac{\pi}{5}$, point (2, 0)

$Amp = A = \frac{Max - Min}{2}$

$Vertical = (C) = \frac{Max + Min}{2}$

$period = p$

Horizontal Stretch/Shrink

$$B = \frac{2\pi}{p}$$

How to choose an appropriate model based on the behavior at some given time, T.

y = A cos B(t – T) + C
if at time T the function attains a maximum value

y = -A cos B(t – T) + C
if at time T the function attains a minimum value

y = A sin B(t – T) + C
if at time T the function halfway between a minimum and a maximum value

y = -A sin B(t – T) + C
if at time T the function halfway between a maximum and a minimum value

Example 7: Calculating the Ebb and Flow of Tides

One particular July 4th in Galveston, TX, high tide occurred at 9:36 am. At that time the water at the end of the 61st Street Pier was 2.7 meters deep. Low tide occurred at 3:48 p.m, at which time the water was only 2.1 meters deep. Assume that the depth of the water is a sinusoidal function of time with a period of half a lunar day (about 12 hrs 24 min)

a) Model the depth, D, as a sinusoidal function of time, t, algebraically then graph the function.

b) At what time on the 4th of July did the first low tide occur.

c) What was the approximate depth of the water at 6:00 am and at 3:00 pm?

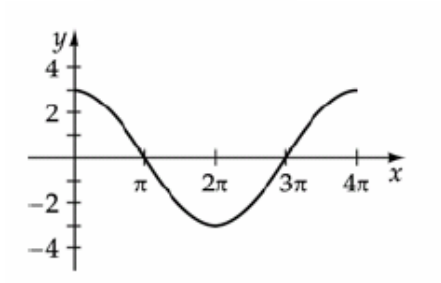
d) What was the first time on July 4th when the water was 2.4 meters deep?

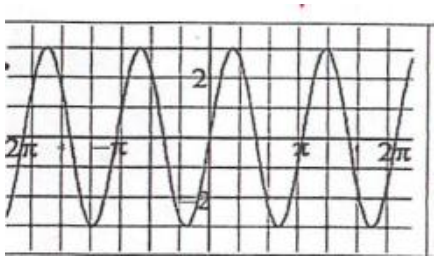
80) Temperature Data: The normal monthly Fahrenheit temperatures in Helena, MT, are shown in the table below (month 1 = January)

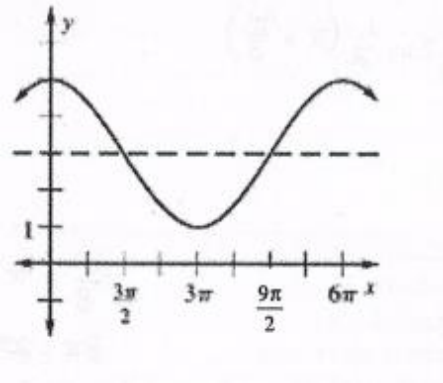
Model the temperature T as a sinusoidal function of time using 20 as the minimum value and 68 as the maximum value. Support your answer graphically by graphing your function with a scatter plot.

M	1	2	3	4	5	6	7	8	9	10	11	12
T	20	26	35	44	53	61	68	67	56	45	31	21

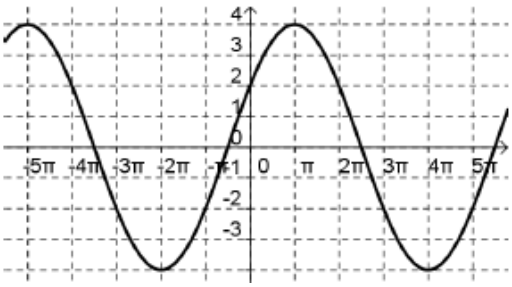
Determine the sinusoidal model from the graph(No phase shift)

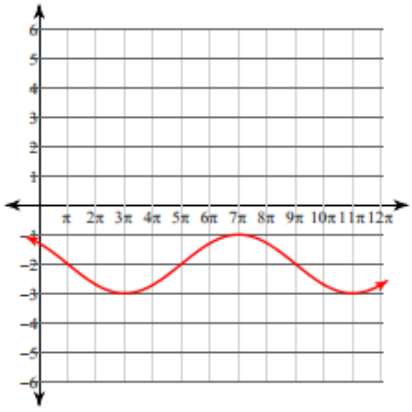






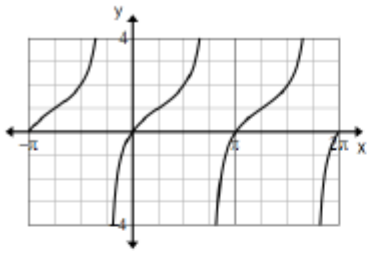
Determine the sinusoidal model from the graph(phase shift)



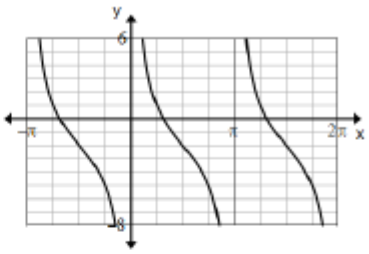


III. Write the equation for each trigonometric function.

12.



13.



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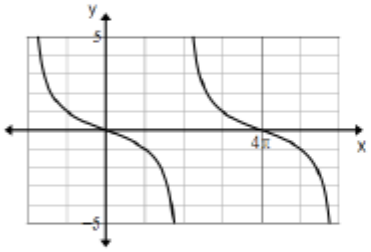

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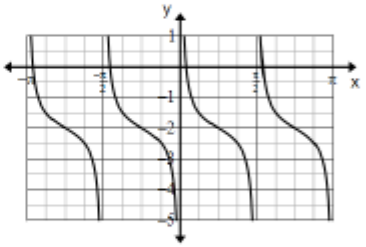

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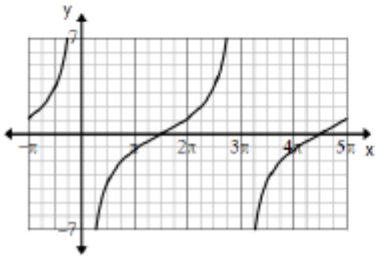

17.