Phase Shift

For the equation $y = A \sin(wx - \emptyset) + B$, write the formula for find the phase shift of a function from this information.

Write the formulas for each of the following properties when fitting a trigonometric function, such as the one above, to data

Amplitude                                       Vertical Shift                                   Period

The following table represents data of the average monthly temperatures (in Fahrenheit) for Alaska

| January, 1 | 25.0 | April, 4 | 40.5 | July, 7 | 56.2 | October, 10 | 43.0 |
|---|---|---|---|---|---|---|---|
| February, 2 | 28.6 | May, 5 | 47.2 | August, 8 | 55.2 | November, 11 | 32.2 |
| March, 3 | 32.9 | June, 6 | 53.8 | September, 9 | 50.2 | December, 12 | 27.9 |

Find the Amplitude, Vertical Shift, Period, and the Phase Shift and write its sinusoidal equation in the form $A \sin(wx - \emptyset) + B$. Then use a graphing calculator to find its line of best fit and write it here.
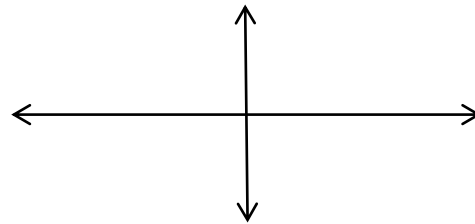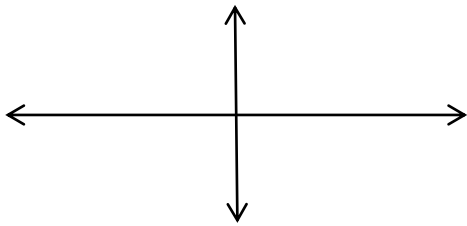
Here's another table for the temps of Washington D.C., do the same as you did above

| January, 1 | 34.6 | April, 4 | 56.5 | July, 7 | 80.0 | October, 10 | 59.7 |
|---|---|---|---|---|---|---|---|
| February, 2 | 37.5 | May, 5 | 66.4 | August, 8 | 78.5 | November, 11 | 49.8 |
| March, 3 | 47.2 | June, 6 | 75.6 | September, 9 | 71.3 | December, 12 | 39.4 |

Find the amplitude, period, and phase shift of each function. Sketch a graph with two periods

- $y = 3\sin(3x - \pi)$

- $y = -2\cos\left(2x - \frac{\pi}{2}\right)$

- $y = 4\sin(\pi x + 2) - 5$

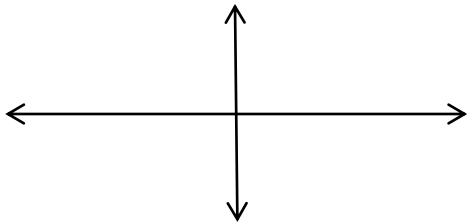Write the sine function with these characteristics

Amplitude: 3
Period: $3\pi$
Phase Shift: -1/3


Amplitude: ½
Period: 4
Phase Shift: 6


Amplitude: 2
Period: $\pi/4$
Phase Shift: 1/4

Graph each equation, using two periods and labeling the key points.

- $y = 3\csc\left(2x - \frac{\pi}{4}\right)$

- $y = -\cot\left(2x + \frac{\pi}{2}\right)$