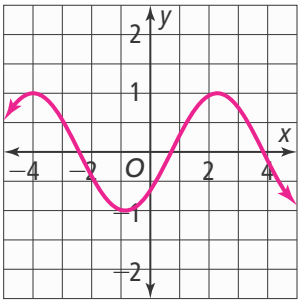
7-6 Additional Practice

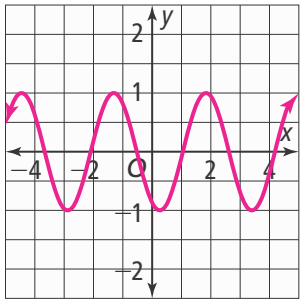
Translating Trigonometric Functions

Sketch the graph of the function.

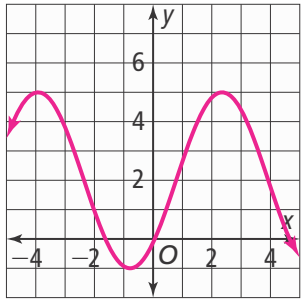
1. $y = \cos(x + 4)$



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



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



Identify the amplitude, period, phase shift, vertical shift, and the maximum and minimum values of the function.

4. $y = \frac{1}{2} \sin\left(x - \frac{\pi}{2}\right)$ **period: 2π, amplitude: $\frac{1}{2}$, phase shift: $\frac{\pi}{2}$ vertical shift: 0; max: 0.5, min: −0.5**

5. $y = 5 \cos 3(x + \pi) + 6$ **period: $\frac{2\pi}{3}$, amplitude: 5, phase shift: $-\pi$ vertical shift: 6; max: 11, min: 1**

6. The table shows the temperatures on different days of the year. Write a cosine model for the data. How does the midline value compare with the average of the 12 temperatures?

$y \approx 8.5 \cos \frac{2\pi}{365} (x - 196) + 81.5$; The average temp is close to the midline value.

Day of the Year	15	48	73	104	136	169	196	228	257	290	323	352
Temperature (°F)	76	73	75	79	82	87	90	89	88	87	83	79

7. Use the data from Item 6 to answer the following questions.

a. Write a sine function to model the weather station data.

Sample: $y \approx 8.5 \sin\left(\frac{2\pi}{365} (x - 196) + \frac{\pi}{2}\right) + 81.5$

b. How do the cosine and sine models differ?

The sine model has a different phase shift compared to its parent function than the cosine model does.

c. Use your sine model to estimate the temperature at the weather station on December 31, day 365.

about 73°F