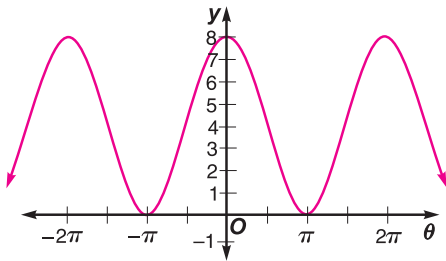**6-5**

Practice
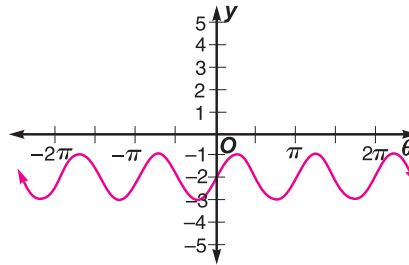
Translations of Sine and Cosine Functions

State the vertical shift and the equation of the midline for each function. Then graph each function.
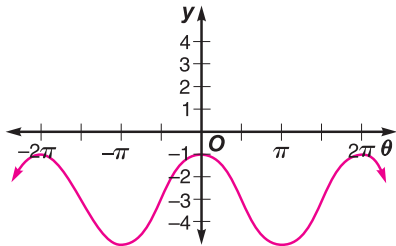
1. $y = 4 \cos \theta + 4$

4 units up; $y = 4$

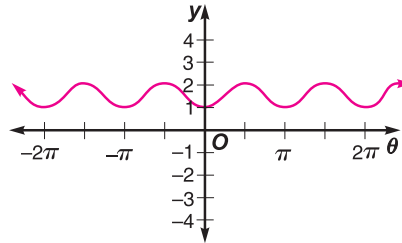**2.** $y = \sin 2\theta - 2$

2 units down; $y = -2$

State the amplitude, period, phase shift, and vertical shift for each function. Then graph the function.

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

2; 2π; $-\frac{\pi}{2}$; -3

4. $y = \frac{1}{2} \cos(2\theta - \pi) + 2$

$\frac{1}{2}$; π; $\frac{\pi}{2}$; 2

Write an equation of the specified function with each amplitude, period, phase shift, and vertical shift.

5. sine function: amplitude = 15, period = 4π, phase shift = $\frac{\pi}{2}$, vertical shift = -10

$y = \pm\, 15 \sin\left(\frac{\theta}{2} - \frac{\pi}{4}\right) - 10$

6. cosine function: amplitude = $\frac{2}{3}$, period = $\frac{\pi}{3}$, phase shift = $-\frac{\pi}{3}$, vertical shift = 5

$y = \pm\, \frac{2}{3} \cos(6\theta + 2\pi) + 5$

7. sine function: amplitude = 6, period = π, phase shift = 0, vertical shift = $-\frac{3}{2}$

$y = \pm\, 6 \sin 2\theta - \frac{3}{2}$

6-5

Transl

In Lesson
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Example 1

Example 2

  Step 1

  Step 2

  Step 3
  Step 4

Sketch the

1. $y = 3$ si

2. $y + 5 =$

Graph one

3. $y = 6$ co

4. $y = 6$ co