NAME _____ DATE _____ PERIOD _____

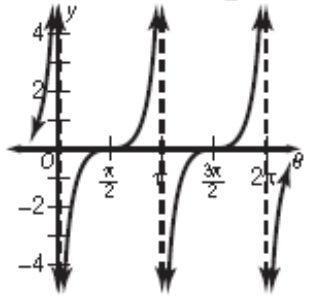
13-8 Practice

Translations of Trigonometric Graphs

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

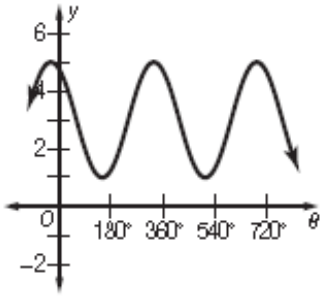
1. $y = \frac{1}{2}\tan\left(\theta - \frac{\pi}{2}\right)$

no vertical shift; no amplitude; π; $\frac{\pi}{2}$



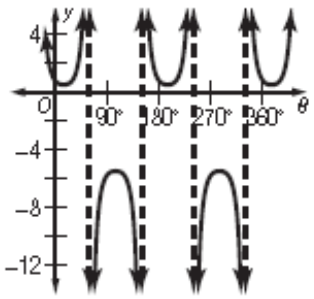
2. $y = 2\cos(\theta + 30°) + 3$

3; 2; 360; −30°



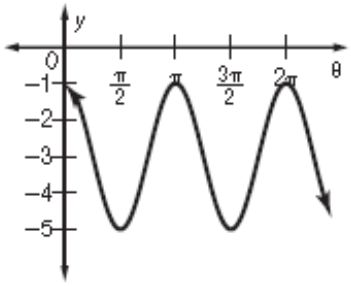
3. $y = 3\sin(2\theta + 60°) - 2.5$

−2.5; no amplitude; 180°; −60°



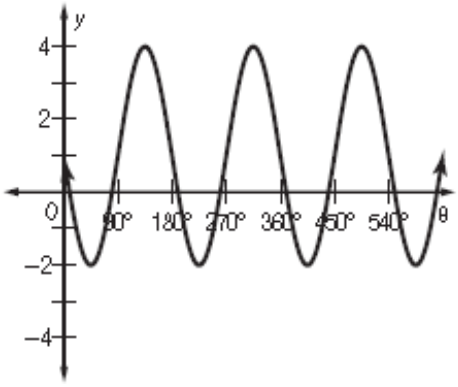
4. $y = -3 + 2\sin 2\left(\theta + \frac{\pi}{4}\right)$

amplitude: 2, period: π, phase shift: $-\frac{\pi}{4}$, vertical shift: −3;



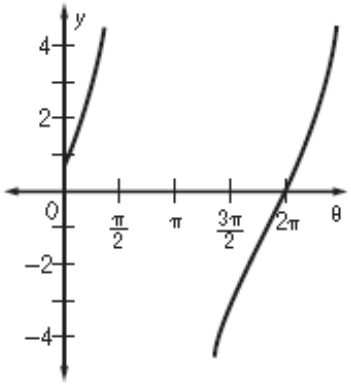
5. $y = 3\cos 2(\theta + 45°) + 1$

amplitude: 3, period: 180°, phase shift: −45°, vertical shift: 1;



6. $y = -1 + 4\tan(\theta + \pi)$

amplitude: 4, period: 2π, phase shift: $-\pi$, vertical shift: −1;



7. ECOLOGY The population of an insect species in a stand of trees follows the growth cycle of a particular tree species. The insect population can be modeled by the function $y = 40 + 30\sin 6t$, where t is the number of years since the stand was first cut in November, 1920.

a. How often does the insect population reach its maximum level?

every 60 yr

b. When did the population last reach its maximum?

1995

c. What condition in the stand do you think corresponds with a minimum insect population?

Sample answer: The species on which the insect feeds has been cut.