NAME _____ DATE _____ PERIOD _____

14-3 Practice

Sum and Difference of Angles Identities

Find the exact value of each expression.

1. cos 75°

2. cos 375°

3. sin (−165°)

4. sin (−105°)

5. sin 150°

6. cos 240°

7. sin 225°

8. sin (−75°)

9. sin 195°

Verify that each equation is an identity.

10. $\cos (180° - \theta) = -\cos \theta$

11. $\sin (360° + \theta) = \sin \theta$

12. $\sin (45° + \theta) - \sin (45° - \theta) = \sqrt{2} \sin \theta$

13. $\cos \left(x - \frac{\pi}{6}\right) + \sin \left(x - \frac{\pi}{3}\right) = \sin x$

14. SOLAR ENERGY On March 21, the maximum amount of solar energy that falls on a square foot of ground at a certain location is given by $E \sin (90° - \phi)$, where ϕ is the latitude of the location and E is a constant. Use the difference of angles formula to find the amount of solar energy, in terms of $\cos \phi$, for a location that has a latitude of ϕ.

15. ELECTRICITY In a certain circuit carrying alternating current, the formula $c = 2 \sin (120t)$ can be used to find the current c in amperes after t seconds.

a. Rewrite the formula using the sum of two angles.

b. Use the sum of angles formula to find the exact current at $t = 1$ second.