

## Applications of Trigonometric Derivatives

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### Learning Objectives

- Compute derivatives of trigonometric functions in application problems
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*Compute derivatives of trigonometric functions in application problems*

1. The number of daylight hours on a particular day of the year in Baltimore, MD is approximately given by the function  $H(t) = 12 - 2.7 \cos\left[\frac{2\pi}{365}(t + 11)\right]$ , where  $t$  is days since the beginning of the year (Jan 1:  $t = 1$ ). Use a derivative to determine when daylight is longest, and when is it shortest.

Days of the Year

Jan 1 = 1	Feb 1 = 32	Mar 1 = 60	Apr 1 = 91
May 1 = 121	June 1 = 152	July 1 = 182	August 1 = 213
September 1 = 244	October 1 = 274	November 1 = 305	December 1 = 335

## ANSWER KEY

1. June 20-21 is the maximum (171.5 days); December 20 is the minimum (354 days)