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Chapter Self-Test

- Which trigonometric function has an asymptote at $x = \frac{5\pi}{2}$?
- Which expression does not have the same value as all the other expressions?
 $\sin \frac{3\pi}{2}, \cos \pi, \tan \frac{7\pi}{4}, \csc \frac{3\pi}{2}, \sec 2\pi, \cot \frac{3\pi}{4}$
- The function $y = \cos x$ is reflected in the x -axis, vertically stretched by a factor of 12, horizontally compressed by a factor of $\frac{3}{5}$, horizontally translated $\frac{\pi}{6}$ units to the left, and vertically translated 100 units up. Determine the value of the new function, to the nearest tenth, when $x = \frac{5\pi}{4}$.
- The daily high temperature of a city, in degrees Celsius, as a function of the number of days into the year, can be described by the function $T(d) = -20 \cos\left(\frac{2\pi}{365}(d - 10)\right) + 25$. What is the average rate of change, in degrees Celsius per day, of the daily high temperature of the city from February 21 to May 8?
- Arrange the following angles in order, from smallest to largest:
 $\frac{5\pi}{8}, 113^\circ, \frac{2\pi}{3}, 110^\circ, \frac{3\pi}{5}$
- Write an equivalent sine function for $y = \cos\left(x + \frac{\pi}{8}\right)$.
- The point $(5, y)$ lies on the terminal arm of an angle in standard position. If the angle measures 4.8775 radians, what is the value of y to the nearest unit?
- The temperature, T , in degrees Celsius, of the surface water in a swimming pool varies according to the following graph, where t is the number of hours since sunrise at 6 a.m.
 - Find a possible equation for the temperature of the surface water as a function of time.
 - Calculate the average rate of change in water temperature from sunrise to noon.
 - Estimate the instantaneous rate of change in water temperature at 6 p.m.

