Chapter 6 Review Extra Practice

1. Convert each of the following radian measurements to degrees. Give your answers to two decimal places, if necessary.

   a) $\dfrac{11\pi}{12}$

   b) 74

   c) 314π

   d) $\dfrac{4\pi}{7}$

   e) $\dfrac{21\pi}{20}$

   f) $\dfrac{\pi}{22}$

2. For each of the following expressions, state an equivalent expression based on a related angle.

   a) $\cot \dfrac{7\pi}{6}$

   b) $\cos \left(-\dfrac{\pi}{6}\right)$

   c) $\tan \dfrac{\pi}{2}$

   d) $\sin \dfrac{\pi}{4}$

   e) $\sec \dfrac{5\pi}{3}$

   f) $\csc \dfrac{7\pi}{4}$

3. The function $y = \cos x$ is the parent function of each of the following trigonometric functions. State the transformations that have been applied to each.

   a) $y = -\dfrac{8}{21} \cos \left(\dfrac{3}{5}(x - 9)\right) + 14$

   b) $y = 77 \cos \left(-\left(x + \dfrac{1}{8}\right)\right) - 22$

   c) $y = 16 \cos \left(\dfrac{7}{15}(x - 5)\right) + 3$

   d) $y = \dfrac{2}{13} \cos (8(x + 7)) - 17$

4. A clock is hanging on a wall, with the centre of the clock 4.5 metres above the ground. Both the minute hand and the second hand are 13 cm long, while the hour hand is 6 cm long. Determine the equations of the sine function that describe the distance of the tip of each hand above the ground as a function of time. Assume that the time t is in hours and that the distance $D(t)$ is in cm. Also assume that at $t = 0$ it is 3 AM.

5. State two points where each of the following functions has an instantaneous rate of change that is a positive value.

   a) $y = -\dfrac{19}{20} \sin (24\pi x) + \dfrac{1}{40}$

   b) $y = 35 \cos \left(\dfrac{x}{12}\right) - 31$

   c) $y = \dfrac{1}{36} \sin (20x) + \dfrac{1}{18}$

   d) $y = 58 \cos \left(\dfrac{9\pi x}{10}\right) - 62$

   e) $y = -\cos \left(\dfrac{x}{100}\right) - 49$

   f) $y = \dfrac{3}{8} \sin (60\pi x) + \dfrac{1}{8}$

6. State the average rate of change of each of the following functions over the interval $\dfrac{\pi}{3} \le x \le \pi$ to two decimal places, if necessary.

   a) $y = \dfrac{5}{9} \cos (16x) - \dfrac{1}{9}$

   b) $y = 27 \sin \left(\dfrac{2x}{3}\right) + 28$

   c) $y = -4 \cos \left(\dfrac{3x}{4}\right) - 1$

   d) $y = \dfrac{17}{20} \sin (4x) + \dfrac{1}{20}$

   e) $y = 33 \cos \left(\dfrac{x}{6}\right) - 31$

   f) $y = 5 \sin (101x) + 4$