1.   Page 50 #35

The depth of water in a tank oscillates sinusoidally once every 6 hours. If the smallest depth is 5.5 feet and the largest depth is 8.5 feet, find a possible formula for the depth in terms of time in hours.

2.   Page 51 #39

(a) Use a graphing calculator or computer to estimate the period of $2\sin(\theta) + 3\cos(2\theta)$.

(b) Explain your answer, given that the period of $\sin(\theta)$ is 2π and the period of $\cos(2\theta)$ is π.

3.   Page 161 #73

The depth of water, y, in meters, in the Bay of Fundy is given as a function of time, t, in hours after midnight, by the function

$$y = 10 + 7.5\cos(0.507t).$$

How quickly is the tide rising or falling (in m/h) at each of the following times?

(a) 6:00 am

(b) 9:00 am

(c) Noon

(d) 6:00 pm

4.   Page 159 #65

The graphs of $\sin x$ and $\cos x$ intersect once between 0 and $\pi/2$. What is the angle between the two curves at the point where they intersect? (You need to think about how the angle between two curves should be defined.)

5.   Page 159 #57

Assuming y is a differentiable function of x, find $\frac{dy}{dx}$ if

$$\sin(ay) + \cos(bx) = xy.$$

6.   For each part below, compute the derivative of the given function.

(a) Page 159 #6

$$z = \sin^3\theta$$

(b) Page 159 #14

$$s(x) = \arctan(2 - x)$$