1.) Convert $670^\circ$ to radians. Convert $-\frac{7\pi}{6}$ to degrees.

2.) Evaluate $\sin\left(-\frac{\pi}{3}\right)$ and $\cos\left(\frac{17\pi}{6}\right)$ (without a calculator). Justify these answers by showing how you’d find them on a unit circle.

3.) (Problem 8.2.42 from the book) Minutes of daylight in a day in Des Moines are given by

$$D = 720 + 200 \left[ \sin \left( \frac{2\pi}{365} (t - 79.5) \right) \right],$$

where $t$ is the number of days after January 1. We’ll restrict ourselves to the cases where $0 \leq t \leq 365$.

a.) How much daylight is there when $t = 45$?

b.) On which days are there exactly 720 minutes of daylight?

c.) On which days (between $t = 0$ and $t = 365$) are the amount of sunlight at their highest? On which days are they at their lowest?

4.) Find the derivative of the following:

a.) $\cos(t^2 + 1)$

b.) $\sin(3t) \cos t$

c.) $\sqrt{t + \cos(t^2)}$

5.) $\cos(7t + \pi) = 1$. What’s $t$?