

8. [13 points] Brianne is hiking, and the temperature of the air in $^{\circ}\text{C}$ after she's traveled x km is a solution to the differential equation

$$y' + y \sin x = 0$$

- a. [7 points] Find the general solution of the differential equation.
- b. [2 points] If the temperature was 10°C at the beginning of the hike, find $T(x)$, the temperature of the air in $^{\circ}\text{C}$ after she's traveled x km. Show your work.
- c. [4 points] Brianne traveled 7 km on the hike. Using the information given in (b), find the coldest air temperature she encountered on the hike. Give an **exact** answer (i.e. no decimal approximations).