1. (1 pt) A car drives down a road in such a way that its velocity (in m/s) at time t (seconds) is

\[ v(t) = 2t^{1/2} + 4 \]

Find the car’s average velocity (in m/s) between \( t = 5 \) and \( t = 9 \).

2. (1 pt) A solid lies between two parallel planes 5 feet apart and has a volume of 39 cubic feet. What is the average area of cross-sections of the solid by planes that lie between the given ones?

3. (1 pt) Find the average value of \( f(x) = 3 \sin x + 3 \cos x \) on the interval \([0, 11\pi/6]\).

Average value =

4. (1 pt) Find the mean value of the function \( f(x) = |7 - x| \) on the closed interval \([4, 8]\).

mean value =

5. (1 pt) In a certain city the temperature (in degrees Fahrenheit) \( t \) hours after 9am was approximated by the function

\[ T(t) = 30 + 9 \sin \left( \frac{\pi t}{12} \right) \]

Determine the temperature at 9 am.

Determine the temperature at 3 pm.

Find the average temperature during the period from 9 am to 9 pm.

6. (1 pt) One fine day in Rochester the low temperature occurs at 5 a.m. and the high temperature at 5 p.m. The temperature varies sinusoidally all day.

The temperature \( t \) hours after midnight is

\[ T(t) = A + B \sin \left( \frac{\pi(t - C)}{12} \right) \]

where \( A, B, \) and \( C \) are certain constants.

The low temperature is 60 and the high temperature is 70.

Find the average temperature during the first 5 hours after noon. Hint: The high and low temperatures can be used together to find \( A \) and \( B \). Determine \( C \) from the fact that it is hottest at 5 p.m.