

You MAY use your calculators.

Traffic flow is defined as the rate at which cars pass through an intersection, measured in cars per minute. The traffic flow at a particular intersection is modeled by the function F defined by

$$F(t) = 82 + 4 \sin\left(\frac{t}{2}\right) \text{ for } 0 \leq t \leq 30,$$

where $F(t)$ is measured in cars per minute and t is measured in minutes.

- (a) To the nearest whole number, how many cars pass through the intersection over the 30-minute period?

- (b) Is the traffic flow increasing or decreasing at $t = 7$? Give a reason for your answer.

- (c) What is the average value of the traffic flow over the time interval $10 \leq t \leq 15$? Indicate units of measure.

- (d) What is the average rate of change of the traffic flow over the time interval $10 \leq t \leq 15$? Indicate units of measure.