

## An average value problem

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