

Average rate of change, using the difference quotient

(Section 1.3)

1) A manufacturer can produce tape recorders at a cost of \$20 apiece. It is estimated that if the tape recorders are sold for p dollars, $p = 120 - x$, consumers will buy x each month.

- Express the manufacturer's profit as a function of x .
- Find a simplified form of the difference quotient for $P(x)$.
- Find the average rate of profit obtained as production increases from $x = 0$ to $x = 20$, interpret.
- From $x = 45$ to $x = 60$, interpret your answer.

2) A manufacturer determined that when x thousand commodities are produced the profit generated will be:

$$P(x) = -400x^2 + 6800x - 12,000$$

- Graph $P(x)$ in an appropriate window.
- Find a simplified form of the difference quotient for $P(x)$.
- At what rate is profit changing when production increases from 3000 to 8000 units?
- From 9000 to 10,000 units, interpret