

DEFINITION: If $C(x)$ is the total cost to produce x items, then the **average cost** per item is given by

$$\bar{C}(x) = \frac{C(x)}{x}$$

REMARK: As more and more items are produced, the average cost per item typically decreases.

EXAMPLE: Find the average cost of producing 100 and 1000 units of the anticlot drug in the previous Example.

Solution: The cost function is $C(x) = 10x + 500$, so the average cost of producing 100 units is

$$\bar{C}(100) = \frac{C(100)}{100} = \frac{10(100) + 500}{100} = \frac{1000 + 500}{100} = \frac{1500}{100} = \$15.00 \text{ per unit}$$

The average cost of producing 1000 units is

$$\bar{C}(1000) = \frac{C(1000)}{1000} = \frac{10(1000) + 500}{1000} = \frac{10,000 + 500}{1000} = \frac{10,500}{1000} = \$10.50 \text{ per unit}$$