Topic: Marginal cost, revenue, and profit

Question: The cost function C models the weekly expenses of a balloon company. What is the company's weekly marginal cost?

$$C(x) = 1.5x + 300$$

Answer choices:

A $1.00

B $1.50

C $1.05

D $300

Solution: B

We can find marginal cost by taking the derivative of the cost formula.

$$C(x) = 1.5x + 300$$

$$C'(x) = 1.5$$

The balloon company's weekly marginal cost is $\$1.50$.

Topic: Marginal cost, revenue, and profit

Question: If a candy company's weekly revenue is modeled by R, how many units should they sell in order to maximize weekly revenue?

$$R(x) = -0.52x^2 + 12x$$

Answer choices:

A 12

B 44

C 23

D 32

Solution: A

To find the marginal revenue function R', take the derivative of R.

$$R(x) = -0.52x^2 + 12x$$

$$R'(x) = -1.04x + 12$$

Set marginal revenue equal to 0, then solve for x.

$$-1.04x + 12 = 0$$

$$1.04x = 12$$

$$x = 11.5$$

Since we can't sell a partial unit, we'll round to $x = 12$. The candy company needs to sell 12 units in order to maximize weekly revenue.

Topic: Marginal cost, revenue, and profit

Question: The cell phone store has monthly costs described by $C(x) = 22.5x + 675$ and monthly revenue described by $R(x) = 0.89x^2 - 22x$. What's their marginal profit if they sell $1{,}000$ units this month?

Answer choices:

A $\$1{,}753.50$

B $\$844{,}825.00$

C $\$1{,}735.50$

D $\$846{,}175.00$

Solution: C

Create a profit equation by subtracting costs from revenue.

$$P(x) = 0.89x^2 - 22x - (22.5x + 675)$$

$$P(x) = 0.89x^2 - 22x - 22.5x - 675$$

$$P(x) = 0.89x^2 - 44.5x - 675$$

To find the marginal profit function, take the derivative of the profit function.

$$P'(x) = 1.78x - 44.5$$

The marginal profit when the stores sells $1{,}000$ units is therefore

$$P'(1{,}000) = 1.78(1{,}000) - 44.5$$

$$P'(1{,}000) = 1{,}735.50$$