Practice 16

Applications of Quadratic Functions

Solve the problem.

1) You have 208 feet of fencing to enclose a rectangular region. Find the dimensions of the rectangle that maximize the enclosed area.

       1) _____

    A) 104 ft by 26 ft   B) 52 ft by 52 ft   C) 54 ft by 50 ft   D) 104 ft by 104 ft

2) A developer wants to enclose a rectangular grassy lot that borders a city street for parking. If the developer has 300 feet of fencing and does not fence the side along the street, what is the largest area that can be enclosed?

       2) _____

    A) 22,500 ft^2 B) 11,250 ft^2 C) 5,625 ft^2 D) 16,875 ft^2

3) A rain gutter is made from sheets of aluminum that are 18 inches wide by turning up the edges to form right angles. Determine the depth of the gutter that will maximize its cross-sectional area and allow the greatest amount of water to flow.

       3) _____

    A) 4.5 inches   B) 5 inches   C) 4 inches   D) 5.5 inches

4) The cost in millions of dollars for a company to manufacture x thousand automobiles is given by the function $C(x) = 4x^2 - 32x + 128$. Find the number of automobiles that must be produced to minimize the cost.

       4) _____

    A) 16 thousand automobiles   B) 64 thousand automobiles
    C) 8 thousand automobiles   D) 4 thousand automobiles

5) The profit that the vendor makes per day by selling x pretzels is given by the function $P(x) = -0.002x^2 + 1.4x - 400$. Find the number of pretzels that must be sold to maximize profit.

       5) _____

    A) 700 pretzels   B) 0.7 pretzels   C) -155 pretzels   D) 350 pretzels

6) The manufacturer of a CD player has found that the revenue R (in dollars) is $R(p) = -5p^2 + 1,670p$, when the unit price is p dollars. If the manufacturer sets the price p to maximize revenue, what is the maximum revenue to the nearest whole dollar?

       6) _____

    A) $1,115,560   B) $139,445   C) $557,780   D) $278,890

7) The owner of a video store has determined that the profits P of the store are approximately given by $P(x) = -x^2 + 130x + 70$, where x is the number of videos rented daily. Find the maximum profit to the nearest dollar.

       7) _____

    A) $4,295   B) $8,450   C) $4,225   D) $8,520

8) The owner of a video store has determined that the profits P of the store are approximately given by $P(x) = -x^2 + 70x + 60$, where x is the number of videos rented daily. Find the maximum profit to the nearest dollar.

       8) _____

    A) $1225   B) $2510   C) $1285   D) $2450

Answer Key
Testname: 16_APPLICATIONS OF QUADRATIC FUNCTIONS

1) B
2) B
3) A
4) D
5) D
6) B
7) A
8) C