MA 120 Calculus & Its Applications Name_____
Final Exam Review Guide Instructor: Kristine King
Part 2 of 4

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve the problem.

1) The Elite Athlete Company estimates that total sales of its new running shoes, TS(x), when spending x thousand dollars on advertising, can be modeled by 1) _____

$TS(x) = -2x^3 + 90x^2 + 1300x + 5000, \quad 5 \le x \le 25$

Locate the point of dimishing returns for TS(x) and interpret its meaning.

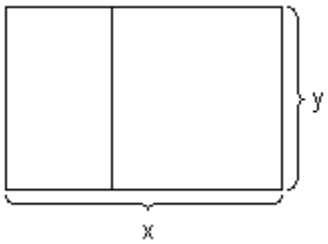
A) (15, 0) is an inflection point. This is the point that the greatest growth in sales is occurring due to advertising.

B) (15, 2650) is an inflection point. This is the point that the greatest growth in sales is occurring due to advertising.

C) (15, 38,000) is an inflection point. This is the point that the greatest growth in sales is occurring due to advertising.

D) (15, 33,000) is an inflection point. This is the point that the greatest growth in sales is occurring due to advertising.

2) Jason has 260 feet of fencing with which to enclose two adjacent lots as shown in the figure below. Determine the dimensions x and y that maximize the total area. What is the maximum area? 2) _____



A) x = 65 feet, $y = 43\frac{1}{3}$ feet; $2816\frac{2}{3}$ square feet

B) $x = 43\frac{1}{3}$ feet, y = 65 feet; $2816\frac{2}{3}$ square feet

C) $x = 14\frac{4}{9}$ feet, $y = 115\frac{5}{9}$ feet; $3338\frac{22}{81}$ square feet

D) $x = 115\frac{5}{9}$ feet, $y = 14\frac{4}{9}$ feet; $3338\frac{22}{81}$ square feet

3) The Olympic flame at the 1992 Summer Olympics was lit by a flaming arrow. As the arrow moved d feet horizontally from the archer, assume that its height h, in feet, was approximated by the function 3) _____

$h = -0.002d^2 + 0.6d + 6.0.$

Find the relative maximum of the function.

A) (150, 45) B) (0, 6.0) C) (150, 51) D) (300, 96)

4) The annual revenue and cost functions for a manufacturer of precision gauges are approximately $R(x) = 500x - 0.01x^2$ and $C(x) = 120x + 100{,}000$, where x denotes the number of gauges made. What is the maximum annual profit? 4) _____

A) $3,510,000 B) $3,610,000 C) $3,810,000 D) $3,710,000

5) The cost of a computer system increases with increased processor speeds. The cost C of a system as a function of processor speed is estimated as $C = 15S^2 - 6S + 1800$, where S is the processor speed in MHz. Find the processor speed for which cost is at a minimum. 5) _____

A) 4 MHz B) 0.2 MHz C) 0.3 MHz D) 1.6 MHz

1) C
2) A
3) C
4) A
5) B