MA 110 Dr. Katiraie QUIZ #2 SPRING 2012

SECTIONS 1.3 AND 2.3

NAME _____**Solutions**_____ SCORE: _____/20

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1) A company manufactures skate boards.

C(x) = 80x + 200 represents the cost for a company that manufactures skateboards, where x is the number of skateboards manufactured and C is the cost, in dollars, of making x skateboards.

A. Interpret the slope of the equation in the context of the problem.

For each additional skateboard manufactured the cost increases by $80.

B. How much will it cost the company to produce 50 skateboards per day?

C = 80(50) + 200 = 4000 + 200 = $4200

C. If the company has enough investments to spend $3000 per day on production, how many skateboards can be made daily?

3000 = 80 x + 200 ➔ 2800 = 80 x ➔ x = 2800/80 = 35 Skateboards

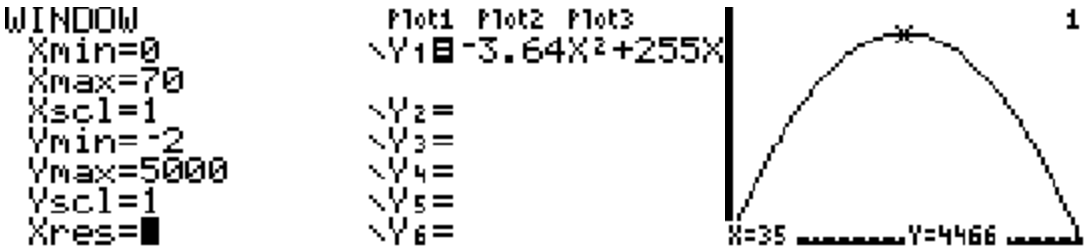
OVER →→→→→

2) The Polaroid company manufactures a new product The PoGo – a pocket size photo printer. The following functions have been established for this product:
Revenue: $R(x) = -3.64x^2 + 255x$ and Cost: $C(x) = 1800 + 40x$
where x, $0 \leq x \leq 70$, is in hundreds, and R(x) and C(x) are in hundreds of dollars.

A. What is the production level of PoGos (to the nearest hundred) at which the company would reach its maximum revenue level.

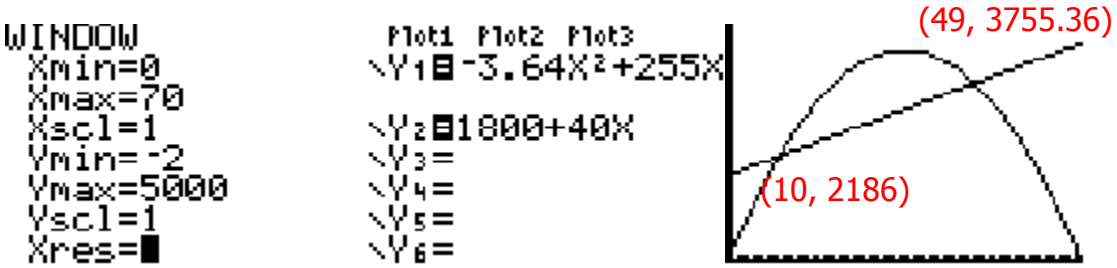
Using the revenue equation: $R(x) = -3.64x^2 + 255x$, I applied the x = -b/2a formula for finding the x-coordinate of the vertex (that is where the maximum revenue will occur). a = -3.64 and b = 255, so x = –b/2a = -255/(2*-3.64) = 35, 35 hundred PoGo

If I want to find this value using a graph, I need to determine the y_{max} for my window. $X_{min} = 0$ and $x_{max} = 70$ (these are given by $0 \leq x \leq 70$ from above), the $y_{min} = 0$. To find a reasonable y_{max}, pick a value of x between 0 & 70. I will use x = 35, for $R(x) = -3.64x^2 + 255x$, $R(20) = -3.64(35)^2 + 255(35) = 4466$. I will use $y_{max} = 5000$



If using calculator, state window size and answer x = 35 hundred PoGos.
Either way the result is: The company must produce 3,500 PoGos to achieve its maximum revenue.

B. Find the production level(s) of PoGos (to the nearest hundred) at which the company has break-even point(s). Sketch a simple graph and indicate your answers on the graph.



Use 5:intersect to find the values. State your window settings, sketch a graph (like above) and state: The company must produce 1000 or 4,900 PoGos to break-even.

C. Will the company make a profit or a loss if it manufactures and sells 1500 PoGos? Explain.

They will make a profit since 1,500 (15 hundred) is in between the break-even production levels of 1,000 and 4,900. The revenue for 15 hundred PoGos is greater than the cost.