Quiz answers for Day 25   MATD 0385   Wed. Apr. 21

Quiz:
An artist paints a painting and then makes some excellent-quality prints of the painting. The information in the following table is the cost and revenue from making and selling these where x = number of prints made / sold.

x	Cost, C	Revenue, R	Profit, P
0	640	0	
10	840	450	
20	1040	900	
30	1240	1350	
40	1440	1800	

1. Graph the Cost Formula and the Revenue formula on the same axes.
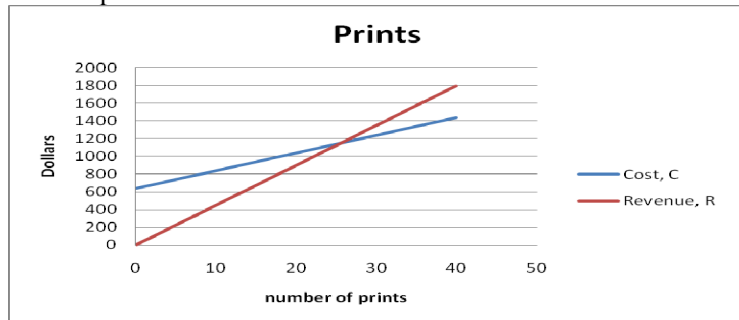
2. Estimate the intersection point. Why is it called the "break-even" point?
Approximately x = 27 and C = R = $1150

3. Write the Cost formula.   (First write it with x and y, then translate it to a formula with x and C.)
    Method: Choose two points, find the slope, find the y-intercept, put it all together.

    Cost:
    $$y = 20x + 640$$
    $$C = 20x + 640$$

4. Write the Revenue formula.
    Method: Choose two points, find the slope, find the y-intercept, then put it all together.

    Revenue:
    $$y = 45x$$
    $$R = 45x$$

5. Find the "break-even" point algebraically.
    Method: Set C = R and solve for x.   Then plug that into either the C or R formula to find the y-value.
    You should get the same thing whether you plug it into the C formula or the R formula since this is the intersection point of the two lines.
    x = 25.6 and C = R = $1152

6. Did the point you found algebraically consistent with the point you estimated from your graph?
    Yes, it is as close as one could expect for an estimate.

7. For this process, what is the fixed cost of making the prints?
    The fixed costs are $640.

8. For this process, what is the cost of making each additional print?
    The cost of making each additional print is $20.

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9. For this process, what is the revenue from selling one print?
    The revenue from selling one print is $45.

10. Use the words slope and intercept to describe the values in the previous three questions.
    7 – intercept of cost formula   8 – slope of cost formula   9 – slope of revenue formula

11. Add a column to the table which is "Profit" and compute the values of Profit for the given x-values.

x	Cost, C	Revenue, R	Profit, P
0	640	0	-640
10	840	450	-390
20	1040	900	-140
30	1240	1350	110
40	1440	1800	360

12. For what values of x is the artist making a profit?
    x = 30 and x = 40

13. For what values of x is the artist having a loss?
    x = 0, x = 10, and x = 20

14. Write the Profit formula.
    $P = R - C$

    $P = 45x - (20x + 640)$

    $P = 25x - 640$

15. How much is the artist's profit or loss when she makes/sells 37 prints?
    $P = 25x - 640$

    $P = 25 \cdot 37 - 640$ So the artist's profit is $285 when she sells 37 prints.

    $P = 285$