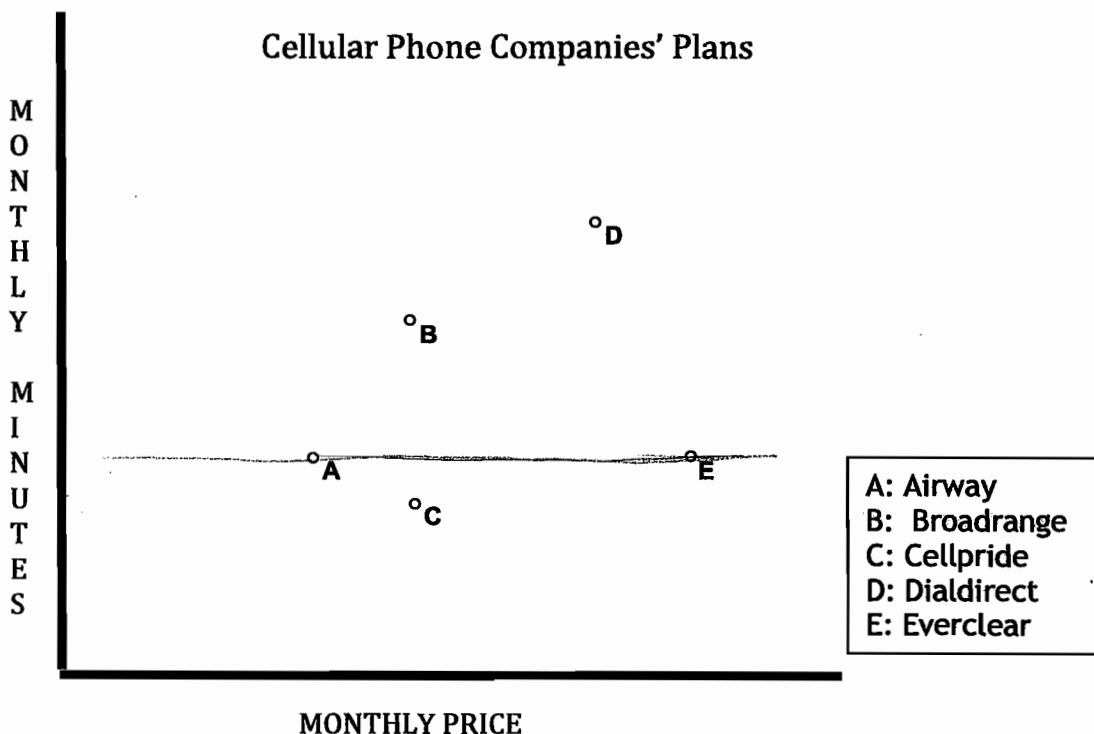


SVMI Performance Assessment Rubric

The Phone Plan	Rubric	
<p>The core elements of performance required by this task are:</p> <ul style="list-style-type: none"> • Interpret a situation involving rates using a scatterplot • Determine an equation of a line. • Find a revenue equation • Determine the maximum revenue that can be generated <p>Based on these, credit for specific aspects of performance should be assigned as follows</p>	points	section points
1. Gives correct answers: A: Airway	1	1
2. Gives correct answer: A: Airway and E: Everclear Gives correct explanation such as: A horizontal line that intersects the same two points indicates the same monthly minutes. Points A and E are two points that lie on a horizontal line	1 1	 2
3. Gives correct answers: B: Broadrange Gives correct explanation such as: The best buy may be found using the line drawn through the origin and the point. The line with the greatest slope indicates the best rate of monthly minutes to cost. The point B line through the origin has the greatest slope.	1 1	 2
4. Gives a correct equation such as: Let c: cost per month and p: potential customers, so $p = -5/16 \cdot c + 25$ <i>Partial Credit:</i> Correct slope $-5/16 = \Delta p / \Delta c$	 2 (1)	 2
5. Gives a correct equation such as: Revenue = $c(-5/16 c + 25)$ or Revenue = $-5/16 c^2 + 25c$	 2	 2
6. Gives correct answers: \$500	1	1
7. Gives correct answers: \$40 per month Shows a correct method such as: Graphing the parabola determined by Revenue = $-5/16 c^2 + 25c$ and determining the vertex point (40, \$500)	1 1	 2
Total Points		12

The Phone Plan Performance Assessment Task

You want to purchase a cell phone. There are five phone companies and each has a different plan that comes with the phone. The plans include monthly minutes and price. A consumer magazine has a graph that shows how the plans compare to one another.



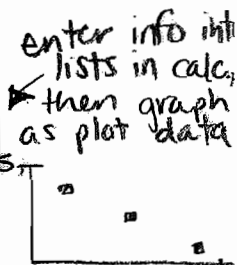
- Which is the least expensive plan? airway plan.
- Do any two plans provide the same amount of monthly minutes? Explain your answer. Yes, plan airway and plan everclear provide the same monthly minutes because they are shown at the same heights (y-coordinate) on the graph
- Which plan is the best buy - providing you more minutes for a smaller price? Explain how you determined your answer. Plan broadrange would be the best buy because it has only one plan cheaper than it, yet also only one other plan with more minutes. it is relatively low on the x-axis (price), yet still very high on the y-axis (# of minutes)

The Phone Plan

Performance Assessment Task

Dialdirect wants to determine how best to price their monthly plan to maximize their revenue. They conduct three surveys of potential customers. Below are data from the surveys.

Surveys	Price Per Month	Potential Customers Willing To Buy Plan (in thousands)
Survey 1	\$48.00	10
Survey 2	\$16.00	20
Survey 3	\$32.00	15



4. Write an equation that shows the relationship between the price per month and potential customers willing to buy the plan. *then plug lists in to calculate linear regression model*

linear regression model: $y = ax + b$
 $a = -.3125$
 $b = 25$

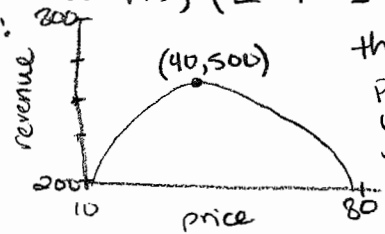
$y = -.3125x + 25$

5. Write a revenue equation in terms of the monthly price and demand for customers. *revenue = quantity · price*
the price is x, as shown on the graph... the equation represents the demand at each price, or the quantity.

$revenue = (-.3125x + 25) \cdot x$

6. What is the maximum revenue that can be earned? \$500

7. To obtain the maximum revenue, how much should Dialdirect charge? Show how you figured it out. *by graphing the revenue equation, $(-.3125x + 25)x$, and adjusting the calculator's window to an appropriate fit, $[10, 80]$ by $[200, 800]$, the graph of revenue is shown:*



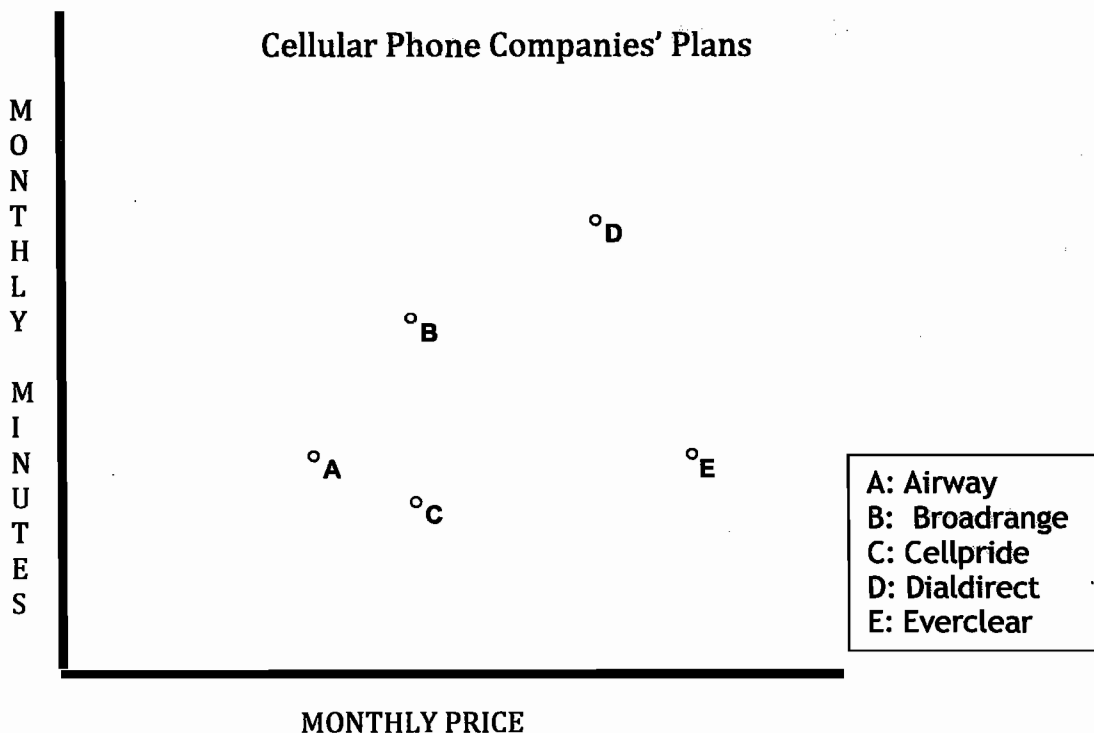
then, use the calculator to calculate the maximum point on the graph, which is (40, 500). the y-value is the max. revenue of \$500, and the x-value is the price at \$40. so, to obtain the maximum revenue of \$500, Dialdirect should charge \$40 for their plan.

The Phone Plan

Performance Assessment Task

S10

You want to purchase a cell phone. There are five phone companies and each has a different plan that comes with the phone. The plans include monthly minutes and price. A consumer magazine has a graph that shows how the plans compare to one another.



- Which is the least expensive plan? Airway.
- Do any two plans provide the same amount of monthly minutes? Explain your answer. Airway & Everclear because they are on the same horizontal line.
- Which plan is the best buy - providing you more minutes for a smaller price? Explain how you determined your answer.
Broadrange because it is second to the cheapest and is second to having the highest amount of minutes per month.

The Phone Plan

Performance Assessment Task

Dialdirect wants to determine how best to price their monthly plan to maximize their revenue. They conduct three surveys of potential customers. Below are data from the surveys.

Surveys	Price Per Month	Potential Customers Willing To Buy Plan (in thousands)
Survey 1	\$48.00	10
Survey 2	\$16.00	20
Survey 3	\$32.00	15

4. Write an equation that shows the relationship between the price per month and potential customers willing to buy the plan.

$$-312.5x + 25000 = \text{demand}$$

5. Write a revenue equation in terms of the monthly price and demand for customers.

$$-312.5x^2 + 25000x = \text{Revenue}$$

$$\text{Revenue} = \text{price} \times \text{demand}$$

6. What is the maximum revenue that can be earned? 500 thousand.

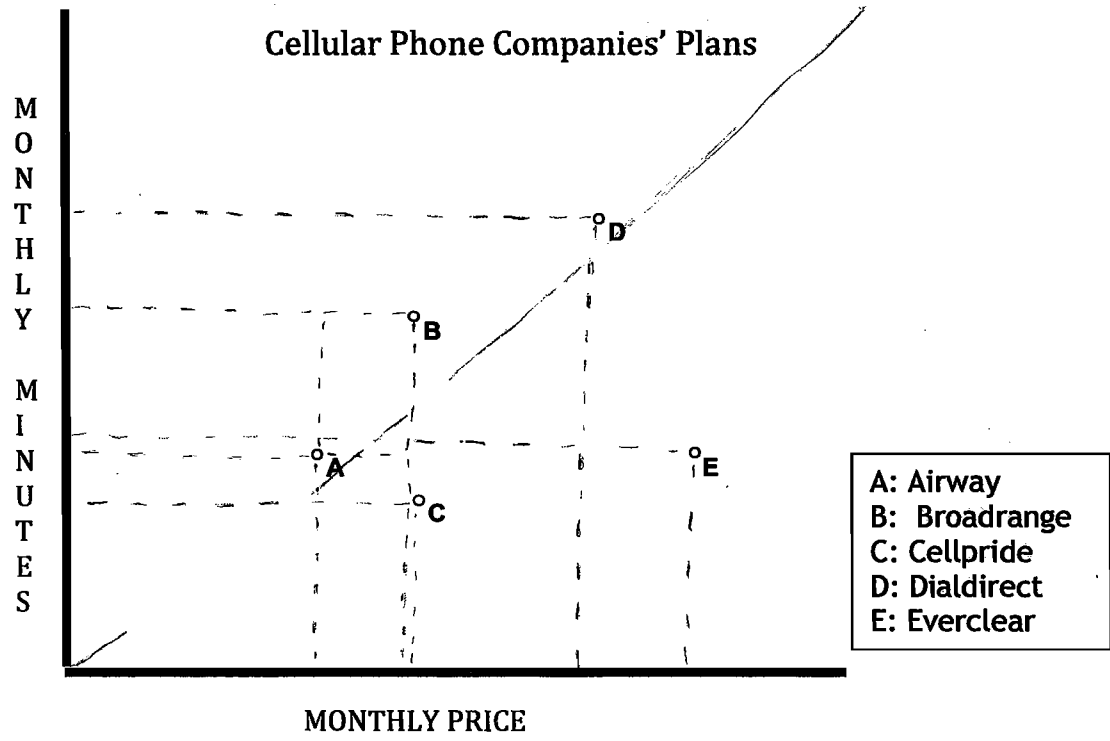
7. To obtain the maximum revenue, how much should Dialdirect charge? Show how you figured it out.

I graphed the Revenue equation and zoomed in on its peak. Its price should be \$40 because at that rate 12.5 thousand will be willing to buy the plan assuming the demand graph is linear.

The Phone Plan

Performance Assessment Task

You want to purchase a cell phone. There are five phone companies and each has a different plan that comes with the phone. The plans include monthly minutes and price. A consumer magazine has a graph that shows how the plans compare to one another.



1. Which is the least expensive plan? Airway.

2. Do any two plans provide the same amount of monthly minutes? Explain your answer.
Airway and Everclear provide the same amount of monthly minutes because the both have the same height on the graph. Everclear, however, is more than twice as expensive.

3. Which plan is the best buy - providing you more minutes for a smaller price? Explain how you determined your answer.
I think that Broadrange is the best buy. It's not the cheapest plan, but you do get the most minutes for your money. Broadrange has the tallest yet thinnest area.

The Phone Plan

Performance Assessment Task

Dialdirect wants to determine how best to price their monthly plan to maximize their revenue. They conduct three surveys of potential customers. Below are data from the surveys.

Surveys	Price Per Month	Potential Customers Willing To Buy Plan (in thousands)
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4. Write an equation that shows the relationship between the price per month and potential customers willing to buy the plan.

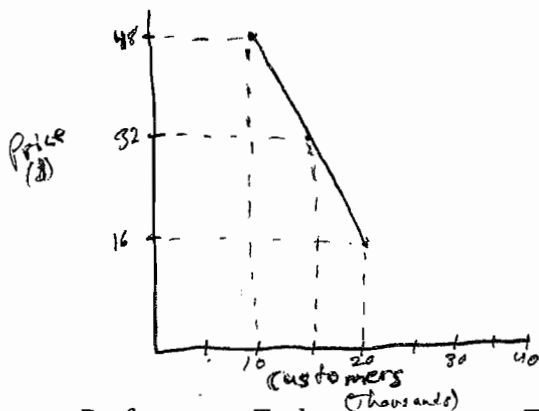
Potential customers $\rightarrow C = P(0.001)$
 Price \uparrow

5. Write a revenue equation in terms of the monthly price and demand for customers.

Revenue \uparrow $R = M_T - E$ Expenses
 Total Money Earned \uparrow

6. What is the maximum revenue that can be earned? \$5,760,000 per year.

7. To obtain the maximum revenue, how much should Dialdirect charge? Show how you figured it out.



Dialdirect should charge \$32.00 per month. Given the information in the survey and this graph, it's the most customers at the highest reasonable price.