

Should I have a Starbucks Habit Or a Keurig Habit?



Algebra 1

Lesson on System of Equations & System of Inequalities

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Starbucks VS. Keurig

Starbucks	Keurig
	 <p>Keurig® K-Cup® K60/K65 Special Edition & Signature Brewers</p> <p>\$189.99 \$140 ON SALE!</p>
No equipment to buy	 <p>20 Count Variety Pack of Starbucks Coffee Single K-Cups for Keurig Brewer</p> <p>\$24.00</p>
Cream provided at Starbucks for no additional cost	 <p>Mini Moo`s Half & Half .5 oz 24/Box</p> <p>\$12.00</p>
Sugar packets provided at Starbucks for no additional cost	 <p>Natural Cane Sugar in the Raw \$.30/each</p>
Paper cups included	No cost for cups since Mrs. Kim will use her ceramic mug

STARBUCKS vs KEURIG

You have seen Mrs. Kim with a cup of Starbucks coffee in her hand each morning. Another math teacher, Ms. Towne, suggests to Mrs. Kim that she purchase a Keurig coffee machine to saving money on her daily coffee fix. Mrs. Kim spends an average of \$4 per cup of her preferred coffee at Starbucks. The prices for the Keurig machine and consumable supplies are given in the chart.

1. What is the one-time setup cost (on sale) of buying the Keurig machine?
2. How much does an individual K-cup cost?

3. How much does an individual Mini-Moos cup of half-and-half cost?

4. Mrs. Kim likes to make her cup of coffee with 1 K-cup, 1 half & half Mini Moo's cup, and 1 packet of sugar. How much does Mrs. Kim spend on consumable supplies for each cup of coffee?

5. Mrs. Kim has decided to calculate the cost of 3 cups of coffee as the cost of the Keurig machine and the price of all the supplies she used up making those 3 cups of coffee (to prepare for her week of return after Fall Break). How much would 3 cups of coffee cost her?

6. Using the method described in the previous question, fill in the T-Chart below for Keurig. Complete the other T-Chart for Starbucks.

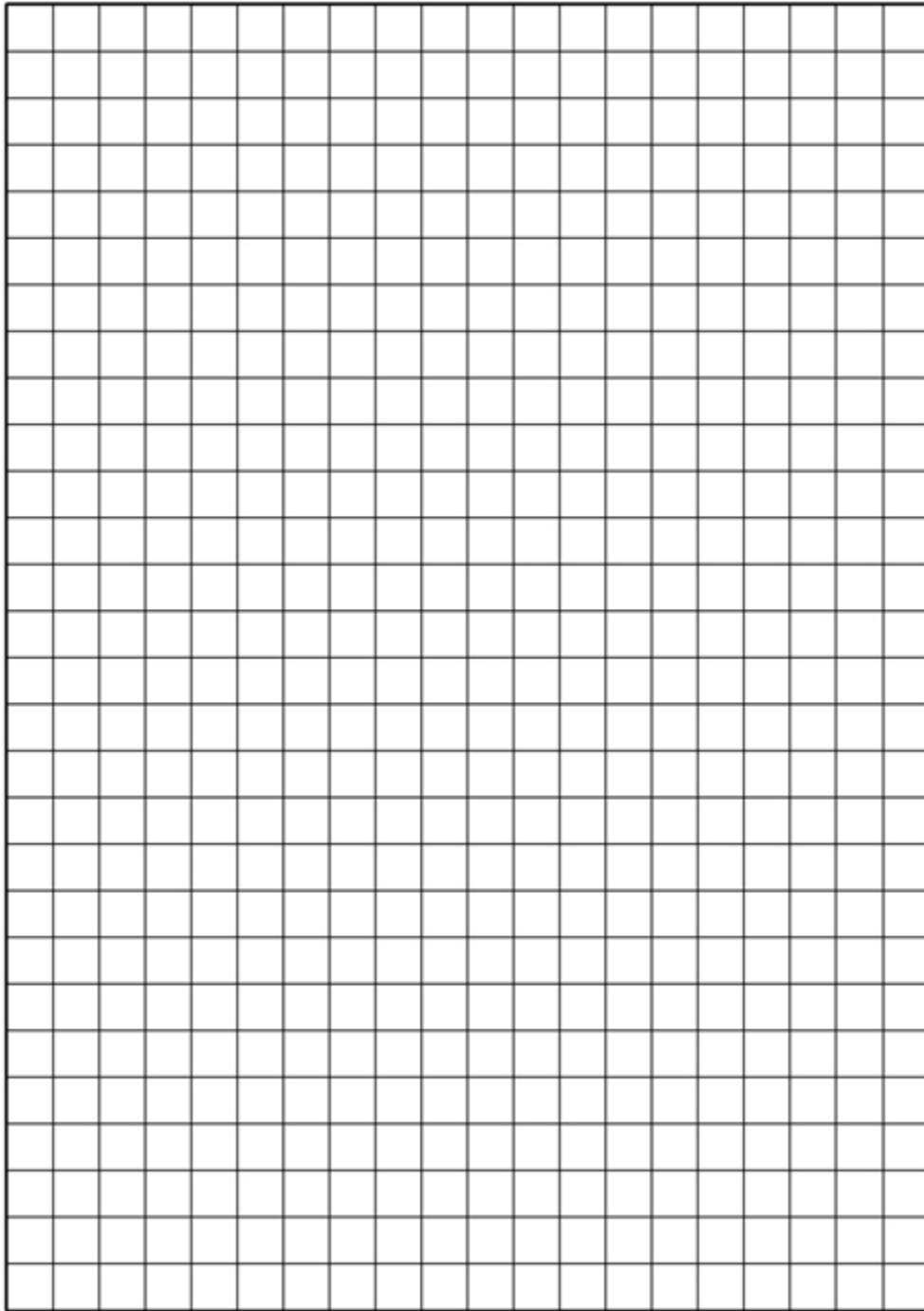
KEURIG	
#of cups	Cost
0	
1	
2	
3	
4	
5	
10	
50	
100	
1 year's worth = _____	
n	
Slope	
Y-intercept	

STARBUCKS	
#of cups	Cost
0	
1	
2	
3	
4	
5	
10	
50	
100	
1 year's worth = _____	
n	
Slope	
Y-intercept	

7. Write an equation using for the function modeling the cost to Mrs. Kim if she chooses Keurig coffee. Let $x = \#$ of cups, $y = \text{cost}$.
8. Write an equation for the function modeling the cost to Mrs. Kim if she chooses Starbucks coffee. Let $x = \#$ of cups, $y = \text{cost}$.
9. If we graphed both equations, what would their point of intersection represent in terms of the problem?
10. Solve the system of equations by graphing (on the next page). Be sure to choose a scale for your x and y axes that will allow you to see the solution. Show up to 100 cups of coffee on your graph.
11. What does the solution mean in this context?

Dependent variable:

.....



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Independent Variable:

.....

12. Is solving by graphing a good method for this situation? What was advantage and disadvantage of using the graphing method?

13. State the y-intercept for each option. Interpret and compare them in terms of the problem.

Starbucks:

Keurig:

14. State the slope for each option. Interpret and compare them in terms of the problem. What does the slope mean in this context?

Starbucks:

Keurig:

15. Solve your system of equations algebraically.

Elimination Method

Substitution Method

16. Compare the three methods you used to find a solution. When might you choose one method over another?

Graphing Method:

Substitution Method:

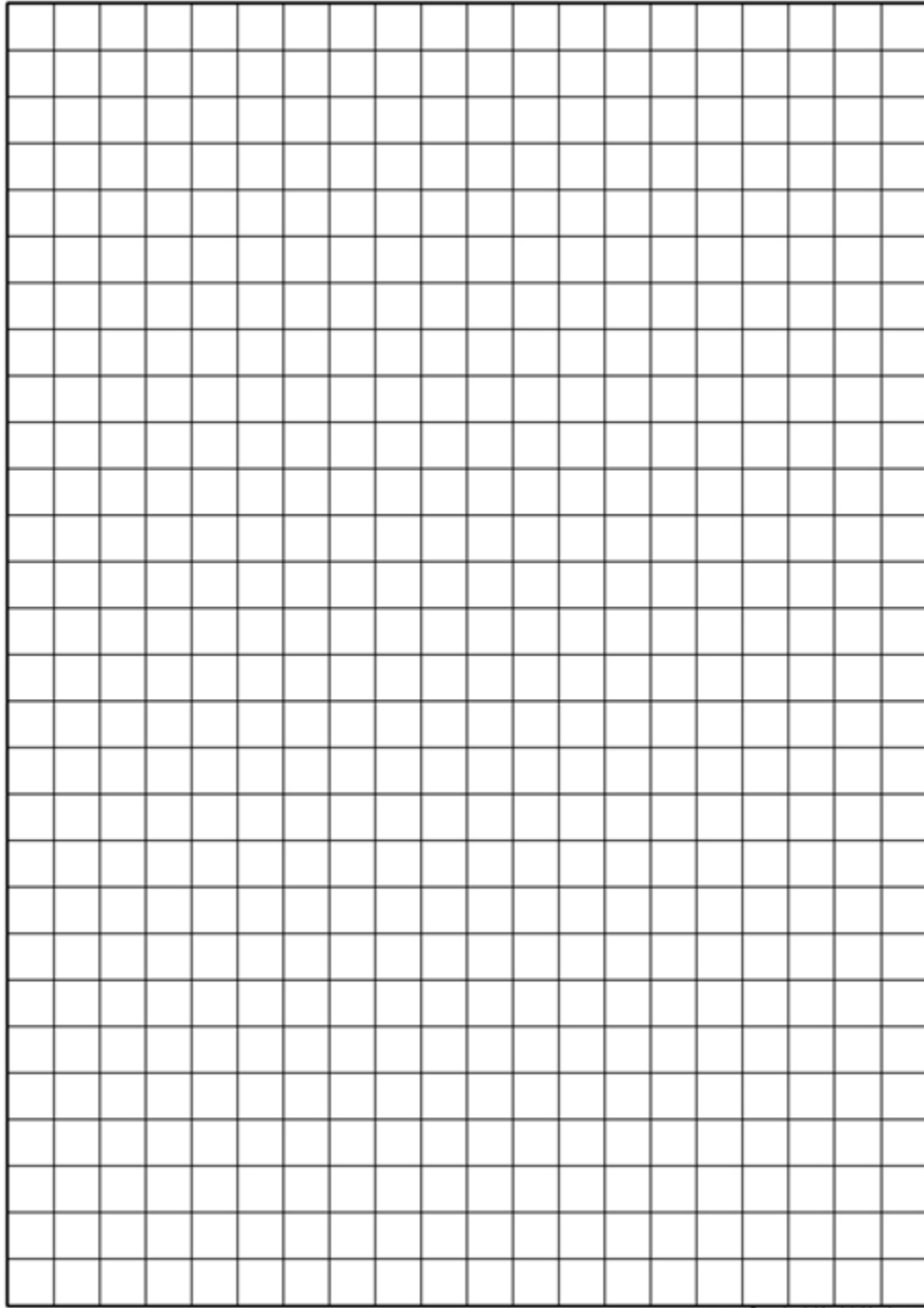
Elimination Method:

17. We assumed that a cup of Starbucks coffee costs \$4, but there are many choices on the menu. The cheapest menu option is \$2. Mrs. Kim purchases x cups of coffee off the menu, but you do not know which she chose. Write an inequality to show what you know about y , the amount of money she spent, based on x cups of coffee.

18. The most expensive menu item is \$6. Write a second inequality to summarize what this tells you about y , the amount of money Mrs. Kim spent on x cups of coffee off the menu.

19. Graph the equations for 15 & 16 on the same graph using two different colors. Your x -axis should show at least between 0 and 100. Your y -axis should be chosen to show both graphs nicely.

Dependent variable: _____



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Independent Variable: _____

20. What does the overlapped shaded area represent?
21. Is it possible to find all possible solutions of a system of inequalities algebraically? Why or why not?
22. Describe Mrs. Kim's possible costs after drinking 100 Starbucks drinks from Starbucks.
23. Starbucks adds a new drink for \$6.50. What effect would that have on our graph? On the solution to our system?
24. Is getting a Keurig machine cost effective compared to purchasing coffee at Starbucks for someone like Mrs. Kim who drinks coffee everyday? Why?

25. You are a Keurig marketing representative. Describe a specific marketing strategy for adult customers to keep them using your product instead of Starbucks. Be sure to mention savings and give suggestions as to how customers could use their savings. How would you change this strategy for teenagers?
26. What are the reasons that people would still consume Starbucks over making their own coffee at home? How could a Starbucks advertiser market their product? Give specific ideas.
27. If Keurig sales keep rising and Starbucks sales start falling because of the price difference, what would be your strategy as a CEO of Starbucks to attract customers back?
28. A third option would be for Mrs. Kim quit drinking coffee altogether. What would be her yearly savings?

29. As Mrs. Kim's financial analyst, write a proposal regarding whether Mrs. Kim should keep purchasing Starbucks or if she should listen to Ms. Towne's recommendation of getting a Keurig machine. Please analyze your results and take a side. Defend your position using not only the mathematical evidence, but using practical reasoning as well.