

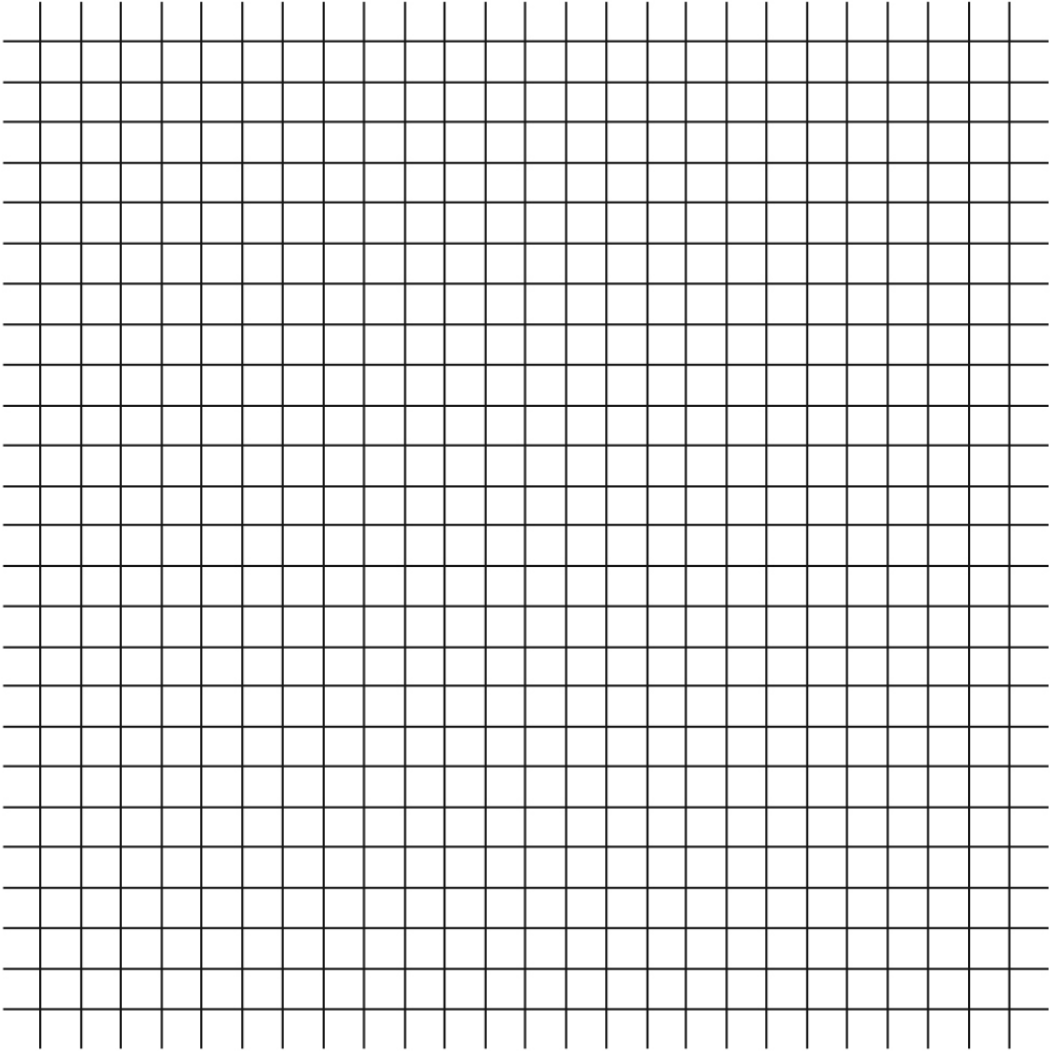
Cell Phone Task

(adapted from *Principles and Standards for School Mathematics*. Reston, VA: NCTM, 2000)

The purpose of this task is to have students examine the concepts of slope and y-intercept in a familiar context. Allow students to work in pairs or small groups to complete this task. Students will use tables, graphs or equations to solve the problem, but should be led to writing an equation by the conclusion of the task. It is very important to discuss the questions emphasizing the relationship between the slope, the context and the equation.

Cell Phone Task

- Using one coordinate graph, draw the graphs of the two cell phone company options using the “Total Number of Minutes Used” versus the “Total Cost per Month”.



- Is it appropriate to connect the points on the graphs to make lines? Explain why or why not.
- What is the slope of Make – A – Call? What does the slope tell you about the company’s rate?
Slope: _____
Meaning of Slope:

4. What is the slope of Chatterbox? What does the slope tell you about the company's rate?

Slope: _____

Meaning of Slope:

5. Which function grows at a faster rate? How can this information be determined from the graph?

Function: _____

How is this determined?

6. Do any lines go through the origin? Explain why or why not.

7. What are the coordinates of the point of intersection? What information does this point give you about the two cell phone companies' plans?

Coordinates: _____

Meaning:

8. Write an equation that can be used to find the total cost per month for each cell phone company for any number of minutes.

Make – A – Call: _____

Chatterbox: _____

9. If Sarah talked for 30 minutes on her cell phone in the month of December, how much would each cell phone company charge her?

Make – A – Call: _____

Chatterbox: _____

10. If Sarah talked for 70 minutes, how much would each company charge her?

Make – A – Call: _____

Chatterbox: _____

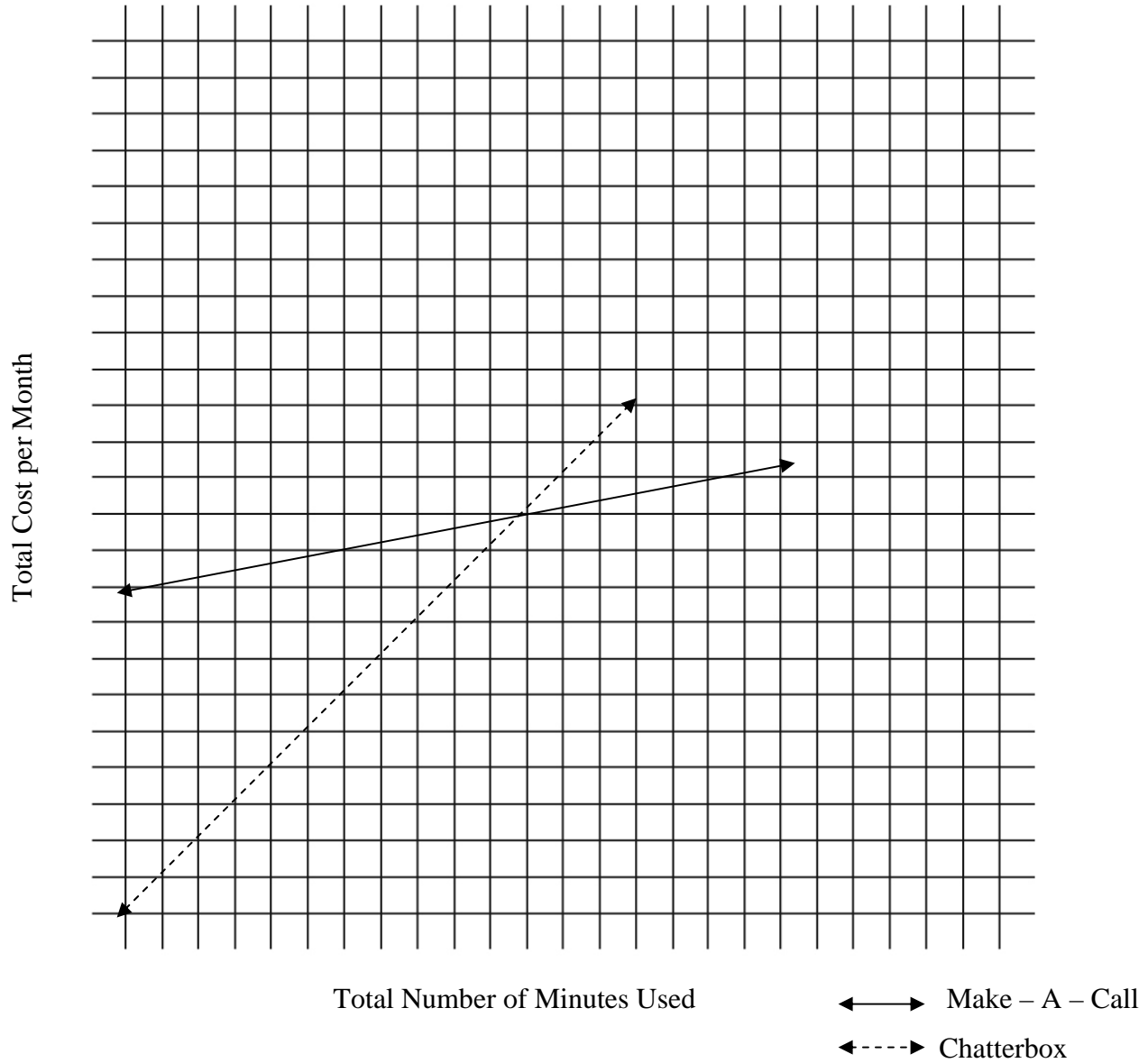
11. How many minutes could Sarah use in a month if she spent \$28 with Make – A – Call? How did you determine your answer?

12. If she spent \$36 with Chatterbox, how many minutes could she use in a month? How did you determine your answer?

13. Create a new cell phone company plan that has a faster rate of growth than both Make – A – Call and Chatterbox. Explain how you know that your company's rate of growth is faster.

Cell Phone Task Answer Key

1. Using one coordinate graph, draw the graphs of the two cell phone company options using the “Total Number of Minutes Used” versus the “Total Cost per Month”.



(Note: The x-scale is 0– 100 interval of 5; the y-scale is 0 – 60 interval of 2.50)

2. Is it appropriate to connect the points on the graphs to make lines? Explain why or why not.

Yes, both the number of minutes and the cost per minute can be expressed in fractional amounts.

3. What is the slope of Make - A - Call? What does the slope tell you about the company’s rate?

Slope: 0.10

Meaning of Slope: For every minute used, the cost increases 0.10.

4. What is the slope of Chatterbox? What does the slope tell you about the company's rate?

Slope: 0.50

Meaning of Slope: For every minute used, the cost increases 0.50.

5. Which function grows at a faster rate? How can this information be determined from the graph?

Function: Chatterbox

How is this determined? From the graph, it is the line that is the steepest.

7. Do any lines go through the origin? Explain why or why not.

The line for Chatterbox goes through the origin because it does not have a fee for 0 minutes like the \$20 that Make-A-Call charges.

8. What are the coordinates of the point of intersection? What information does this point give you about the two cell phone companies' plans?

Coordinates: (50, 25)

Meaning: For both plan the cost at 50 minutes will be the same, \$25.00.

9. Write an equation that can be used to find the total cost per month for each cell phone company for any number of minutes.

Make – A – Call: $y = 20 + 0.10x$

Chatterbox: $y = 0.50x$

9. If Sarah talked for 30 minutes on her cell phone in the month of December, how much would each cell phone company charge her?

Make – A – Call: \$23.00

Chatterbox: \$15.00

10. If Sarah talked for 70 minutes, how much would each company charge her?

Make – A – Call: \$27.00

Chatterbox: \$35.00

11. How many minutes could Sarah use in a month if she spent \$28 with Make – A – Call? How did you determine your answer?

She would use 80 minutes. I replaced the y in the equation with 28 and solved for x .

12. If she spent \$36 with Chatterbox, how many minutes could she use in a month? How did you determine your answer?

She would use 72 minutes. I replaced the y in the equation for Chatterbox and solved for x .

13. Create a new cell phone company plan that has a faster rate of growth than both Make – A – Call and Chatterbox. Explain how you know that your company's rate of growth is faster?