

The Concept of Slope: Graphing Equations and Inequalities



by

Qingxia Li, Xinyao Yang, and Howsikan Kugathasan

Peter and James are discussing how to raise funds for the Children’s Hospital in Nashville, Tennessee.

Peter: How are you doing? I’ve been working on my farm and haven’t seen you in a while.

James: I found a summer intern job at a Children’s Hospital. I am *so* busy. I have no time to hang out anymore. But it’s all worth it when I see the happy faces of these children.

Peter: Great job, man! Maybe we could do something together for these kids.

James: Sure. I want to do something for a boy named Kett. He was seriously injured in an accident and his parents had no insurance. How about we raise some funds for him?

Peter: I have some peaches on my farm and we can sell them.

James: Good idea, bro!

Peter and James: Let’s go!

Peter and James decide to prepare a cart of peaches to take to the local farmers market. The market price for a pound of peaches is \$2. James’s aunt also offered them corn from her farm to sell for raising the funds. She gave them twelve ears of corn per unit, and recommended they charge \$5 per unit. At the end of the second day, James and Peter earned \$124. How many pounds of peaches and units of corn did Peter and James sell at the farmers market?

Questions

- (a) Given the weight of peaches and units of corn in Table 1, find the corresponding cost of peaches and corn and fill in the right-hand columns. Inversely, given the cost of peaches and corn, find the weight of peaches in pounds and the number of units of corn and fill in the left column of Table 2.

Table 1

<i>Pounds of peaches</i>	<i>Cost of peaches</i>
2	
5	
7	
<i>Units of corn</i>	<i>Cost of corn</i>
1	
10	
12	

Table 2

<i>Pounds of peaches</i>	<i>Cost of peaches</i>
	\$100
	\$25
	\$50
<i>Units of corn</i>	<i>Cost of corn</i>
	\$100
	\$60
	\$15

Qingxia Li is an assistant professor in the Department of Mathematics and Computer Science, Fisk University, Nashville, Tennessee. Xinyao Yang is a graduate student in the Department of Mathematics, University of Missouri, Columbia, Missouri. Howsikan Kugathasan is an undergraduate student in the Department of Mathematics, Fisk University, Nashville, Tennessee.

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1. (b) Construct a rectangular coordinate system with the appropriate x and y axes that will represent the weight of peaches and the cost of peaches. Plot the points in Table 1 above in the rectangular coordinate system.



2. James has sold two pounds of peaches. How much more money does James earn if he sells three more pounds of peaches? Use the numbers in the chart (Question 1 (b)) above to calculate the cost.
3. What is the ratio of the extra money to the additional pounds of peaches sold in Question 2? Show your work in detail.
4. Explain the meaning of the ratio in Question 3 and relate this ratio to your graph from Question 1 (b).

5. How could Peter and James make an exact \$100 donation by selling a mixture of peaches and corn with at least ten pounds of peaches and ten units of corn? Specify the hypothesis of the sales and determine how many different combinations of corn and peaches that they can have. Plot all these points on a rectangular coordinate system.



6. Write the equation of the line in the standard form and find the x and y intercepts of the graph.

7. List three different combinations of peaches and corn that would total \$124.00.

8. Plot all these points on the graph. Find the common characteristics that these points share.



9. Shade the regions that show how Peter and James can earn more than \$100 and less than \$100, respectively. Explain the reasoning on the shading area of the graph.