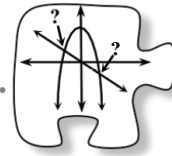


3.1.4 How can I use systems?

Using Systems of Equations to Solve Problems

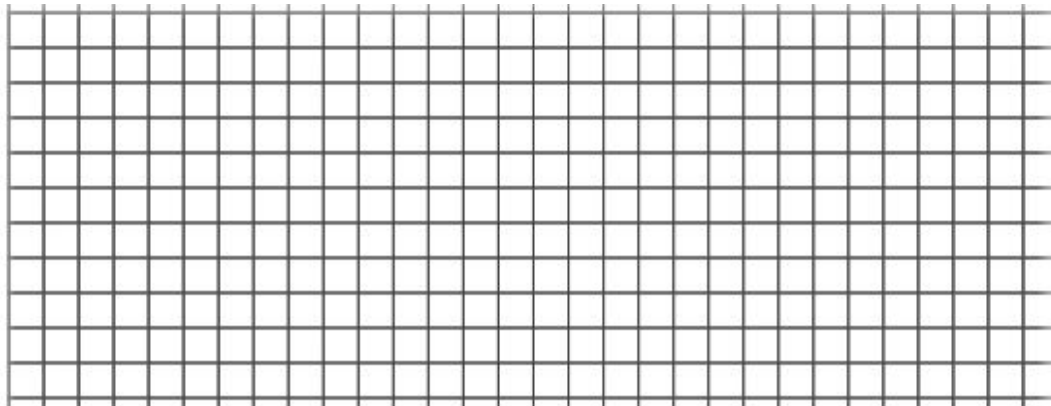


#56 HOW TALL IS HAROLD?

Jamal and Dinah are still eating lunch as they come into math class. Someone has left a book on the floor and they both trip. As they each hit the floor, the food they are carrying flies across the room directly toward Harold, who is showing off his latest dance moves.

As Jamal and Dinah watch in horror, Jamal's cupcake and Dinah's sandwich splat right on top of Harold's head! Jamal's cupcake flies on a path that would have landed on the floor 20 feet away from him if it had not hit Harold. Dinah's sandwich flies on a path that would have landed on the floor 24 feet away from her if it had not hit Harold. Jamal's cupcake flies 9 feet high, while Dinah's sandwich reaches a height of 6 feet before hitting Harold.

Graph the situation and scale by ones:



Jamal's Equation (cupcake):

Dinah's Equation (sandwich):

#56 Continued

How tall is Harold? Show your solution using tables and algebra

Cupcake

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Sandwich

--	--

Algebra

What assumptions did you make in modeling this situation?

#57 Lucky you! You are a new college graduate and you have already been offered two jobs. Each job involves exactly the same tasks, but the salary plans differ, as shown below.

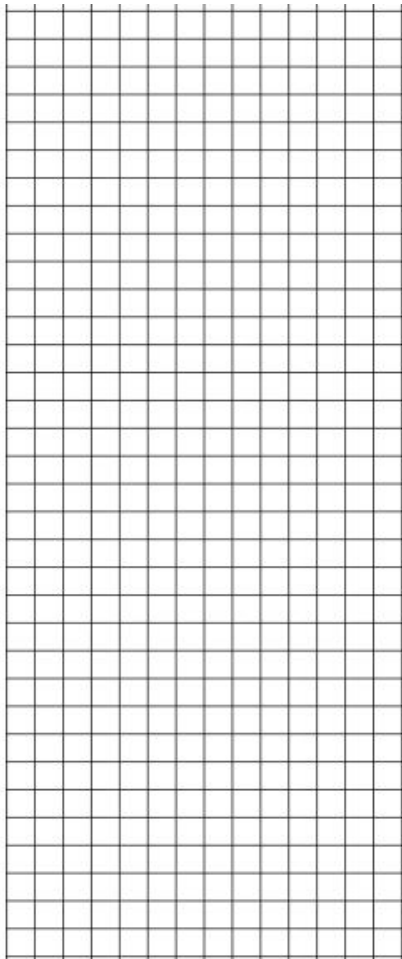
- Systems Incorporated offers a starting salary of \$52,000 per year with an annual increase of \$3,000.
- A job at Functions Unlimited starts with a salary at \$36,000 per year with a raise of 11% each year.

Systems Incorporated Salary Equation:

Functions Unlimited Salary Equation:

a. Under what conditions would choosing the job with Systems Incorporated be the better choice? When would choosing the job with Functions Unlimited be the better choice? Use graphs, tables, and equations to help you justify your answer.

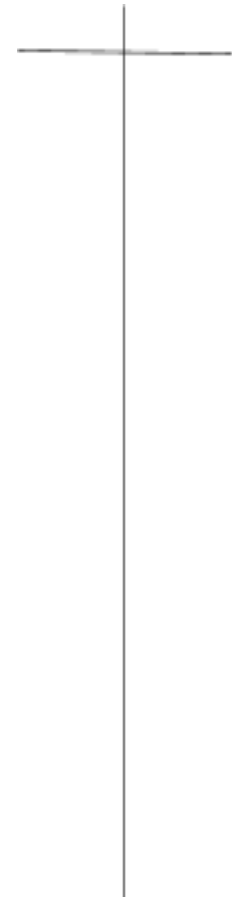
Graph (choose appropriate scale)



Tables

**Systems
Incorporated**

**Functions
Unlimited**



#57 (a) Continued

Algebra

b. How could you change the salary plan so that the job with Functions Unlimited is always the better choice? How could you change the salary plan so that the job with Systems Incorporated is always better? If it is not possible for Systems Incorporated or Functions Unlimited to always be a better choice, explain why not.