

Analyzing & Sorting Graphs

PROBLEM 1 What's the Dependency?

Have you ever planned for a party? You may have purchased ice, gone grocery shopping, selected music, made food, or even cleaned in preparation. Many times, these tasks depend on another task being done first. For instance, you wouldn't make food before grocery shopping, now would you?



Let's consider the relationship between:

- I
the number of hours worked and the money earned. D
- D
your grade on a test and the number of hours you studied. I
- I
the number of people working on a particular job and the time it takes to complete a job. D

There are two quantities that are changing in each situation. When one quantity depends on another in a problem situation, it is said to be the **dependent quantity**. The quantity that the dependent quantity depends upon is called the **independent quantity**.



1. Circle the independent quantity and underline the dependent quantity in each statement.



2. Describe how you can determine which quantity is the independent quantity and which quantity is the dependent quantity in any problem situation.

the dependent quantity changes based on the independent quantity.



3. Read each scenario and then determine the independent and dependent quantities. Be sure to include the appropriate units of measure for each quantity.

Cut out each graph on the following pages. Then, analyze each graph, match it to a scenario, and tape it next to the scenario it matches. For each graph, label the x- and y-axes with the appropriate quantity and unit of measure. Then, write the title of the problem situation on each graph.

1.

Something's Fishy

Candice is a building manager for the Crowley Enterprise office building. One of her responsibilities is cleaning the office building's 200-gallon aquarium. For cleaning, she must remove the fish from the aquarium and drain the water. The water drains at a constant rate of 10 gallons per minute.

- independent quantity:

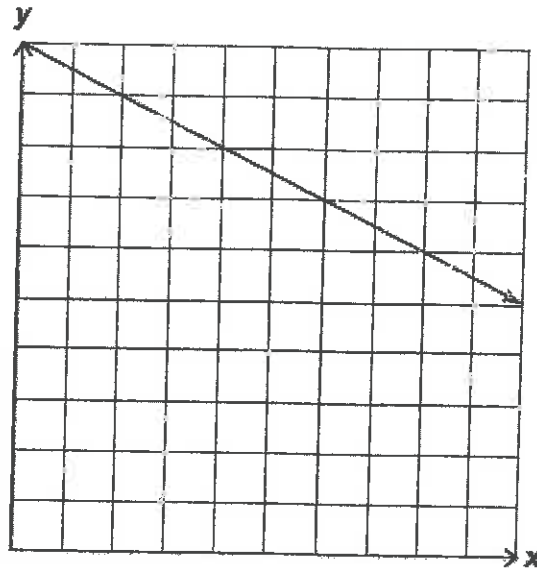
time in minutes.

- dependent quantity:

Volume of water.
gallons

Volume in Gallons

Graph H



time in minutes.

2.

Smart Phone, but Is It a Smart Deal?

You have had your eye on an upgraded smart phone. However, you currently do not have the money to purchase it. Your cousin will provide the funding, as long as you pay him interest. He tells you that you only need to pay \$1 in interest initially, and then the interest will double each week after that. You consider his offer and wonder: is this really a good deal?

- independent quantity:

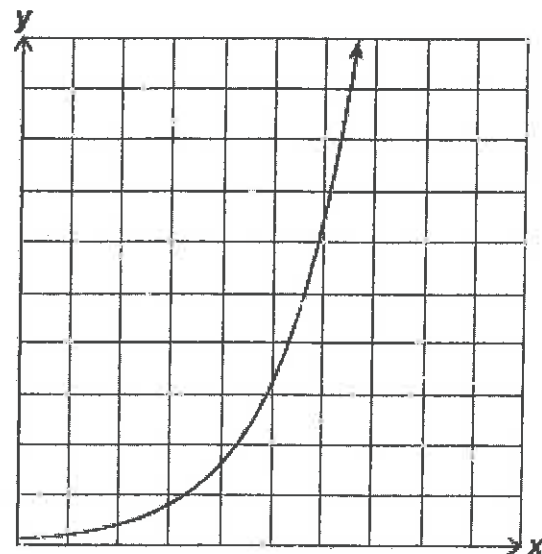
time in weeks.

- dependent quantity:

Interest owed.
dollars.

Interest in dollars

Graph B



time in weeks.

3.

Baton Twirling

Jill is a drum major for the Altadena High School marching band. She has been practicing for the band's halftime performance. For the finale, Jill tosses her baton in the air so that it reaches a maximum height of 22 feet. This gives her 2 seconds to twirl around twice and catch the baton when it comes back down.

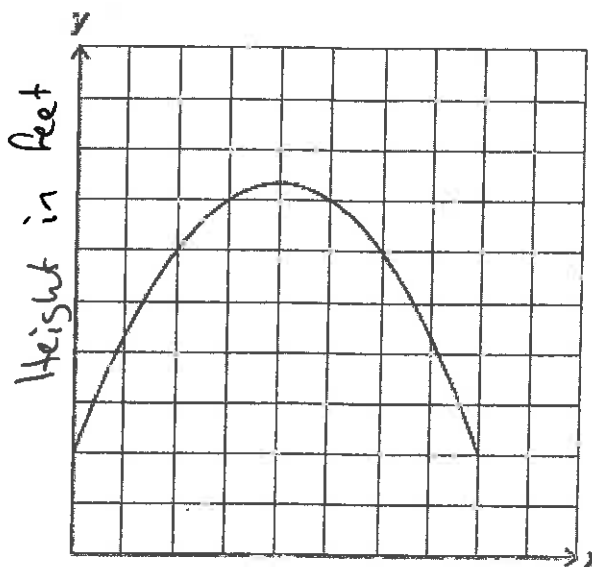
- independent quantity:

time in seconds

- dependent quantity:

Height in feet.

Graph F



4.

Can't Wait to Hit the Slopes!

time in seconds

Andrew loves skiing—he just hates the ski lift ride back up to the top of the hill. For some reason the ski lift has been acting up today. His last trip started fine. The ski lift traveled up the mountain at a steady rate of about 83 feet per minute. Then all of a sudden it stopped and Andrew sat there waiting for 10 minutes! Finally, the ski lift began to ascend up the mountain to the top.

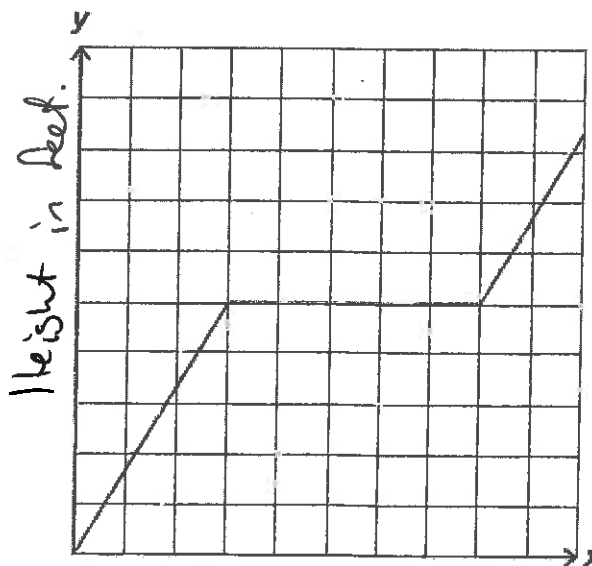
- independent quantity:

time in minutes.

- dependent quantity:

Height in feet.

Graph G



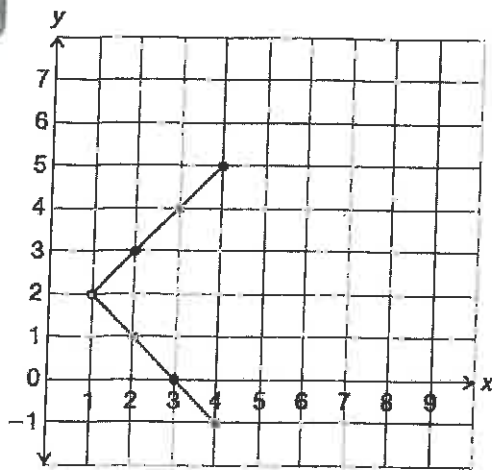
time in seconds

Relations & Functions:

Use the points on the Graph to complete the corresponding table of values.



Graph A



x	y
1	2
2	1
2	3
3	0
3	4
4	-1
4	5

Does this graph represent a Relation?

yes.

What is the Domain of this graph? Range?

D: $1 \leq x \leq 4$ R: $-1 \leq y \leq 5$

Does this graph represent a Function?

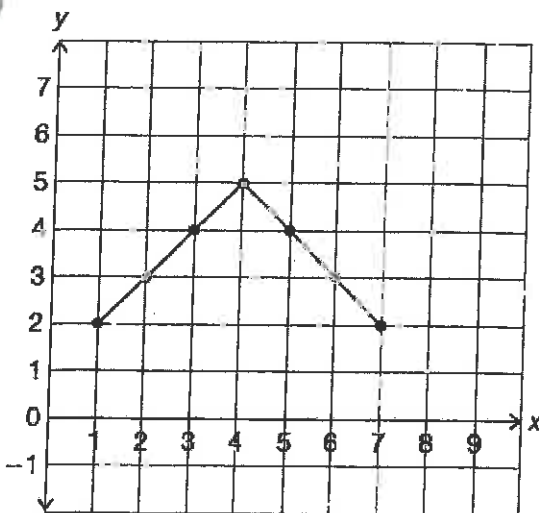
no \rightarrow Some x-values have more than 1 y-value.

Is this graph Discrete or Continuous?

Continuous - "no breaks."



Graph B



x	y
1	2
2	3
3	4
4	5
5	4
6	3
7	2

Does this graph represent a Relation?

yes.

What is the Domain of this graph? Range?

D: $1 \leq x \leq 7$
R: $2 \leq y \leq 5$

Does this graph represent a Function?

yes - each x has exactly 1 y.

Is this graph Discrete or Continuous?

Continuous - "no breaks"



Analyze each graph and circle the terms (Relation, Function, Discrete, Continuous) that apply. Then, state the Domain and Range of each.

Note: Each axis tick mark represents 2 units.

<p>A</p> <p> <input checked="" type="checkbox"/> Relation <input checked="" type="checkbox"/> Function <input type="checkbox"/> Discrete <input checked="" type="checkbox"/> Continuous Domain $0 \leq x \leq 9$ Range $0 \leq y \leq 10$ </p>	<p>B</p> <p> <input checked="" type="checkbox"/> Relation <input checked="" type="checkbox"/> Function <input type="checkbox"/> Discrete <input checked="" type="checkbox"/> Continuous Domain $-3 \leq x \leq 7$ Range $-10 \leq y \leq 2$ </p>	<p>C</p> <p> <input checked="" type="checkbox"/> Relation <input checked="" type="checkbox"/> Function <input type="checkbox"/> Discrete <input checked="" type="checkbox"/> Continuous Domain $-10 \leq x \leq 10$ Range $-4 \leq y \leq 6$ </p>
<p>D</p> <p> <input checked="" type="checkbox"/> Relation <input checked="" type="checkbox"/> Function <input type="checkbox"/> Discrete <input checked="" type="checkbox"/> Continuous Domain $-10 \leq x \leq 10$ Range $0 \leq y \leq 10$ </p>	<p>E</p> <p> <input checked="" type="checkbox"/> Relation <input type="checkbox"/> Function <input type="checkbox"/> Discrete <input checked="" type="checkbox"/> Continuous Domain $-4 \leq x \leq 4$ Range $-4 \leq y \leq 4$ </p>	<p>F</p> <p> <input checked="" type="checkbox"/> Relation <input type="checkbox"/> Function <input checked="" type="checkbox"/> Discrete <input type="checkbox"/> Continuous Domain $\{-2, -1, 0, 1, 2\}$ Range $\{0, 1, 4\}$ </p>