

Leaky Faucets



Part 1

Mr. Green's hobby was restoring old houses. He recently purchased an old rundown house that needed a lot of repair, especially with the plumbing. The kitchen faucet dripped all day and night. It intrigued Mr. Green how much water dripped from this faucet in one day, but he surely didn't want to sit and watch the faucet drip all day. So he figured that if he could discover how much water dripped within a certain time span, he could calculate the dripping rate for any time span. In his first observation he noted that 6 ounces of water dripped in 10 minutes.

A) Using Mr. Green's observation, can you help him figure out how much water would have dripped in only 5 minutes?

B) Create a table to display Mr. Green's observations if he continued to document his observation every 10 minutes for the next hour.

C) Mr. Green wants to know how much water will have leaked after 14 hours, but he doesn't want to spend the time to construct a table as you did in Part B. Can you find a shortcut for him, possibly an equation or proportion? Justify why your shortcut works.

Part 2

Mr. Green is still repairing that old, rundown house he recently purchased. He finally fixed that leaky faucet in the kitchen, but now the bathroom faucet is leaking. He's wondering if the dripping rate is the same as the kitchen, so again he starts his observations. However, this time he notes that 8 ounces of water dripped in 12 minutes.

A) At this rate, how many ounces of water will drip in a 24-hour period?

B) To Mr. Green's surprise, he didn't fix the kitchen faucet as well as he thought. It started leaking again at the same rate it did before, 6 ounces in 10 minutes. If Mr. Green puts a bucket under both the kitchen and bathroom faucets, will they ever contain the same amount of water at the same time within a 24-hour period? Justify your answer using words or diagrams.

Part 3

With both faucets still leaking, Mr. Green is still convinced that there is a pattern in the dripping rates for the kitchen and bathroom faucets. However, before he can be sure, he must document some specific information and he needs your help.

A) Identify the unit rate for each faucet.

B) Is the relationship between time and ounces proportional for each faucet? Explain your reasoning using connections from prior responses.

C) On the same coordinate plane, sketch the graph of both faucets. How can you tell from the graph that the relationship between time and ounces is proportional or not for each faucet? Justify your answer.


