Description of the task: threeacts.mrmeyer.com/leakyfaucet/

How Long Does it Take To Fill Up The Sink?

Table

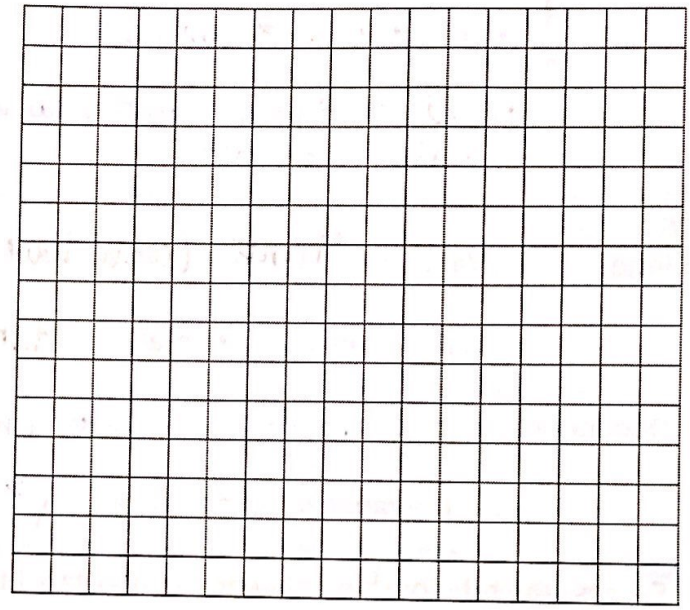
Label variables, include units please.

0	
10	
20	
30	
100	
500	
1000	
1500	

Trying to get V=_____ mL

Graph

Create and label axes; include units.



Equation

Define your variables:

Information Needed To Answer

- What is The Capacity of The Sink?
  3 gallons
- How much Water is Dripping?
  ≈ 1 drop / 2 seconds
- How many mL are in a gallon?

Summary of the task: Be sure to answer the question(s) posed by the task.

Part 1: Leaky Faucet: threeacts.mrmeyer.com/leakyfaucet/

What questions do you have?

- drops are dripping at a constant rate (assume its same over time)
- speeding up video misrepresents time passing
- x-value → time
- y-value → amount of water
- need to figure out how much water is lost

Why are we doing this? To describe what is happening as a pattern, seen in different ways

DISCRETE VARIABLES: set number of values a variable can be

Identify:

- Independent Variable: TIME (could have been sec, min, hr)
  - Express the **domain** in set notation: time ≥ 0
- Dependent Variable: volume of water (mL, gallons)
  - Express the **range** in set notation: $y \geq 0$
- Express the relationship between the two variables in function notation:

Continuous variables: values can be anything (fractions, decimals)

Part 2:

There are different types of functions based on its patterns, graphs and equations.

Definition: a *Linear Function*

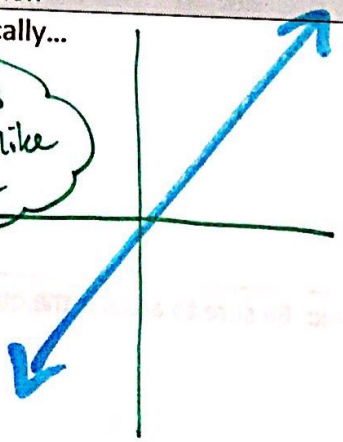
...in equation form...

ex: $8.5x = y$ ← x has an exponent of one (invisible)

$y = mx + b$ function form

...graphically...

always looks like a line



Example 2:

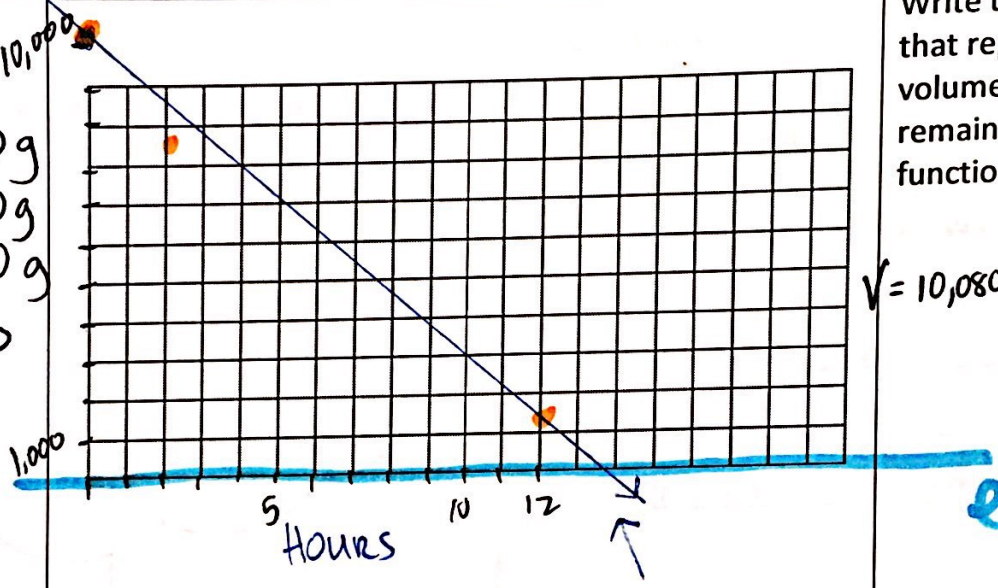
A swimming pool is being drained at a rate of 720 gallons per hour. If it has a capacity of 10,080 gallons, how long does it take to drain?

a. Identify the independent variable: hours (continuous)
Identify the dependent variable: gallons (continuous)

Pattern

x	y
0	10,080 g
1	9,360 g
2	8,640 g
12	1,440

Graph



$0 = 10{,}080 - 720(h)$

$-10{,}080 \quad -10{,}080$

$\frac{-10{,}080}{-720} = \frac{-720h}{-720}$

$h \approx 14$ hrs

Equation

Write the function, V(t), that represents the volume of water that remains in the pool as a function of time.

$V = 10{,}080 - 720h$

Identify what each part of the equation stands for.

h: hours of draining

V = volume of water left in pool

Answer the question: how long does it take to be emptied? Confirm with the formula.