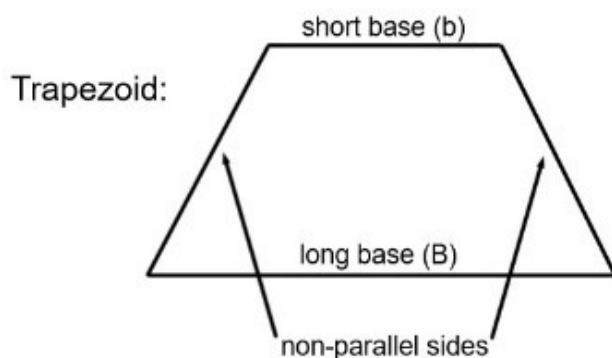


# Pretest DA

MTH-3051

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- (5 marks) For each of the following Geometry problems, define variables, make an inequality, then solve.
  - My property is a rectangle with the long sides 2m longer than the short sides. If I have 80m of fence, what is the longest my short side can be in order for the fencing to be enough to completely surround the property?
  - The perimeter of an isosceles trapezoid is less than 50cm. The two non-parallel sides are each 2cm longer than the shorter base, while the longer base is double the length of the shorter base. What is the greatest possible length for the short base?



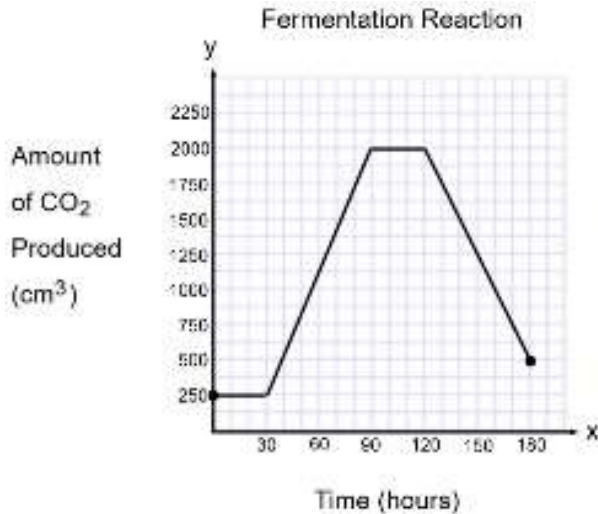
- (27 marks) Abby has a tractor with an empty tank. She puts in 3L of gas and drives for 6km before running out of fuel.

Later, her daughters Alyssia and Kaylee arrive with some gas. They want to make a graph of a different situation. They must drive the tractor at a speed of 10km/hr. They are not sure, however, which variable is dependent and which is independent. Alyssia thinks the distance depends on the time, but Kaylee thinks the opposite is true.

- Create equations for Abby and for each daughter.
- Graph all three equations.
- Explain the relationship between Alyssia and Kaylee's equations.

3. (5 marks) In the laboratory we conducted an experiment where we allowed yeast to ferment a solution of water and molasses. We measured the volume of CO<sub>2</sub> produced. We ended the experiment after 180 hours by pouring the solution down the drain.

Using the provided graph, give the following characteristics.



- Domain and Range
  - Interval where the function is increasing
  - Interval where the function is strictly decreasing
  - Maximum and minimum
  - y-intercept and x-intercept
  - Rate of change during the interval [100,110] and explain what it means in this situation
  - Positive and Negative intervals
  - Initial and final values, and explain what they mean in this situation
4. (5 marks) The following table of values shows amounts of crushed peas and broth that were used making a recipe for animal feed:

|   |    |    |    |    |
|---|----|----|----|----|
| X | 10 | 15 | 25 | 40 |
| y | 8  | 10 | 14 | 20 |

x = # of L of peas

y = # of L of broth

- Derive the rule for the relation.
- Derive the inverse rule.
- Using the inverse rule, calculate how many liters of broth would be needed to combine with 12L of peas.
- Calculate how many liters of peas would be needed to combine with 30L of broth.

5. (27 marks) A, B and C worked as tree planters in a reforestation project/ By the time they started their shift on Friday, A had planted 1400 trees so far that week, B had planted 1520 trees and C had planted 1480 trees.

During their shift on Friday, they planted trees at slightly different speeds. A planted 2.2 trees per minute, B planted 2 trees per minute and C planted 2.1 trees per minute.

At quitting time on Friday, A and B had planted the same total number of trees for the week. How many minutes long was Friday's shift? How many trees did C plant that week?

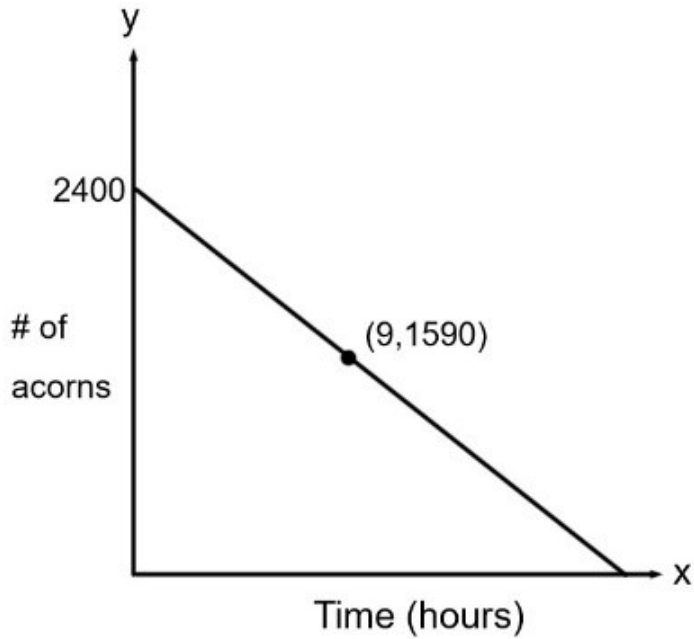
6. (5 marks) On March 1, I loaned \$500 to each of my two kids, and allowed them to repay me in installments. If a kid's birthday happened while they still owed me money, I subtracted \$100 from their debt as a present.

The older kid paid me \$30 every two weeks, starting on March 15. The younger kid \$80 on the first day of each month, starting in April.

| Kids' Birthdays |             |
|-----------------|-------------|
| Older kid       | September 5 |
| Younger kid     | October 20  |

- a) Make a graph for each kid's payments from March 1 until July 1 putting amount still owed as the dependent variable and time as the independent variable.
- b) Who will pay their debt first? Justify your answer.
- c) For each kid, what amount will they pay as their final payment?

7. (26 marks) My neighbor and I each collected acorns from a tree that lies on the border between our properties, and we each filled a wheelbarrow with them. But animals kept taking the acorns. My wheelbarrow started with 2200 acorns, and it lost them at a rate of 80 acorns per hour. My neighbor's loss of acorns is illustrated in the following graph:



- a) How many hours went by before we each had the same number of acorns left in our wheelbarrows?
- b) Whose wheelbarrow will empty first? Explain.