

# Pretest DB

MTH-3051

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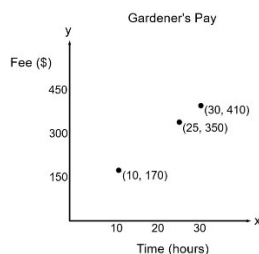
1. (5 marks) Solve:

- a)  $\frac{x}{5} - 3 \geq 12 + 2x$
- b)  $10a - 7 \leq 5a - 21$
- c)  $0.4x - 3 + 7 > -1.2x$
- d)  $\frac{9}{2} - 3c < -6c - \frac{3}{2}$

2. (5 marks) For each situation, give the dependent and independent variables:

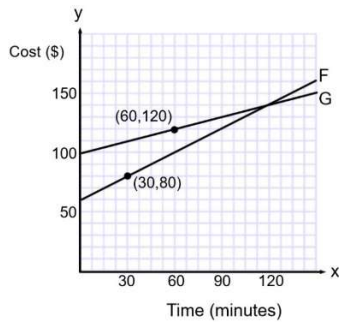
- a) To rent an auger, you must pay \$100 plus \$50 per day.
- b) At the monster truck show, we measure the speed of the truck as it reaches the beginning of the jump ramp, and we measure how many seconds the truck stays in the air before landing.
- c) I want to make a graph that shows how many hours each student spent in class before the exam, and also shows the grade the student achieved on the exam.
- d) A surfer notices how high the waves become and also notices how fast the wind is blowing that day.

3. (5 marks) A gardener charges a set price for a visit, plus an hourly fee. This situation is shown in the following graph:



- a) How many dollars per hour does he charge?
- b) What is his set price for a visit?
- c) If he doubled his set price for a visit, how would it change the points given in the graph?

4. (27 marks) The following graphs show the cost of hiring gardeners F and G to work on the vegetable garden I am building.



The cost of hiring a third gardener H is a first-degree polynomial function like those for F and G. It is given by the following rule:

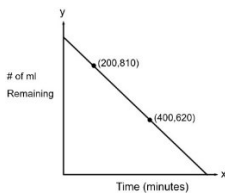
$$H(x) = (1/2)x + b \quad \dots \text{and } H(x) \text{ goes through the point } (20, 97.5)$$

Find the point of intersection for functions F and G. Then determine if function H also passes through that same point of intersection.

5. (27 marks) The evaporation of 1 Liter of liquid M has the following table of values:

Time (hours)	Remaining liquid (ml)
x	m(x)
3	750
4	680
5	610

The evaporation of liquid N is shown in the following graph:



- Test the table of values for a constant difference. Show your work. Is the function linear?
- Which liquid reaches a level of 80% evaporation first?
- Is the rate of evaporation greater in liquid M or in liquid N?

6. (5 marks) Bush beans cost \$3/dozen, plus \$12 for a bottle of fertilizer that will be more than enough for my needs. Vine beans cost \$2.40/dozen, plus the cost of \$18 for a different type of fertilizer. I need to plant a number of bean plants for my employer, who is paying me a lump sum to do so, and is letting me choose which type of bean to plant.
- For what number of bean seeds would Vine or Bush beans cost the same?
  - If I decide to plant 100 seeds, which type of bean costs less?
  - If I decide to plant 160 seeds, which type of bean costs less?

7. (26 marks) Vanessa and Alinda were hired to show Scout leaders how to make wreaths during a Scout conference. Each participant pays a fee for materials so that they can keep the wreath they made. Vanessa and Alinda both prepared for this by buying wreath-making materials for the participants to use.

Vanessa paid \$400 for materials. She charges the students \$30 each. The following incomplete table of values shows how many participants she taught as a function of the number of minutes that had elapsed since the beginning of the day. Her final profit was \$860.

X	56	96	104	200
y	7	12	13	25

Alinda's profits are found with the following function:

$$a(x) = 3x + b \quad \text{where } x = \text{the number of minutes elapsed and } f(x) = \text{the profit.}$$

After 1.5 hours, Linda's profit had reached \$25. She taught for 1 hour less than Vanessa. What was Alinda's final profit for the day?