COLLEGE ALGEBRA NAME________________

The normal length L of a giant earthworm (measured in cm) is approximately a functions of its age t (measured in weeks). This function can be represented by the following piece-wise symbol rule:

$$L(t) = \begin{cases} 1.5\,t & , \text{ if } 0 < t \leq 4 \\ 0.5t + 4 & , \text{ if } 4 < t < 6 \\ 7 & , \text{ if } 6 \leq t \leq 10 \end{cases}$$

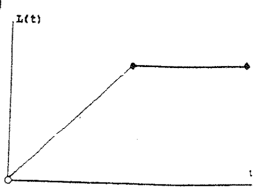
1. What is the normal length of a giant earthworm that is 4 weeks old? Express this information in function notation. 1. ____________

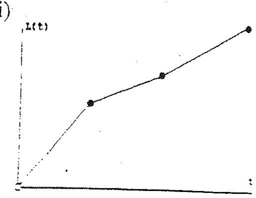
2. Evaluate $L(8)$ and then interpret this value in the context of the problem. 2. ____________

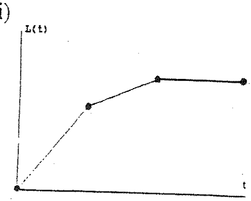
3. What is the domain of L? 3. ____________

What does this domain tell you about the normal life span of a giant earthworm?

4. Which of the following graphs *could be* a good graph of the function L? Circle your answer.

i) 

ii) 

iii) 

iv) none

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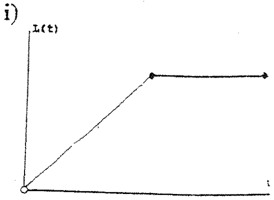
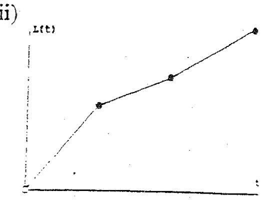
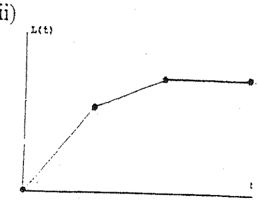
i) 

ii) 

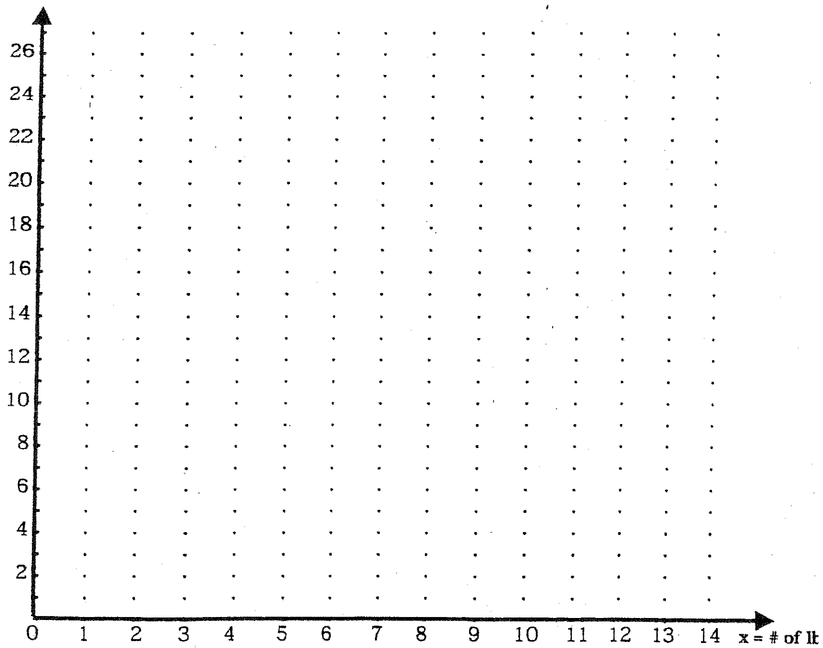
iii) 

iv) none

Name: .... ID#: ....Sec: ....

1. ***The cost of one pound of candy is $2.00. If you buy more than 10 lbs. of candy, then for each additional pound over 10 lbs. you are charged $1.50/lb.***

a) Graph below <u>very neatly</u> the price, P, you pay as a function of the number of pounds, x, you buy, for $0 \text{ lbs} \le x \le 14$ lbs.



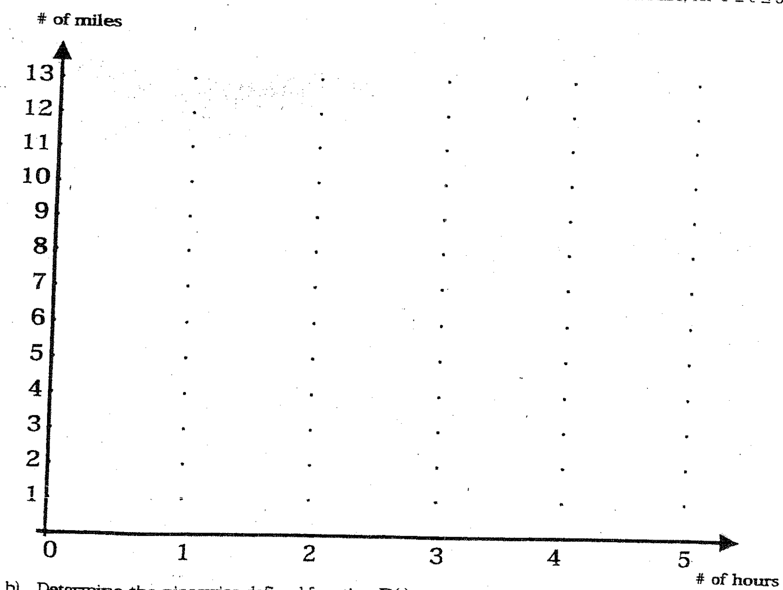
b) Write the equations of the P(x) along with their domain of definition.

Simplified:

P(x) = { ....
....

2. ***Margie walked away from her house for 2 hours at 3 miles/hour; next, she jogged for 1 hour at 5 miles per hour. After that, she stopped for one hour to rest. After her rest, she resumed her walk towards her house at a speed of 2 miles/hour.***

a) Graph her distance, D(t), from her house from the moment she left her house, for $0 \le t \le 5$.



b) Determine the piecewise defined function D(t).

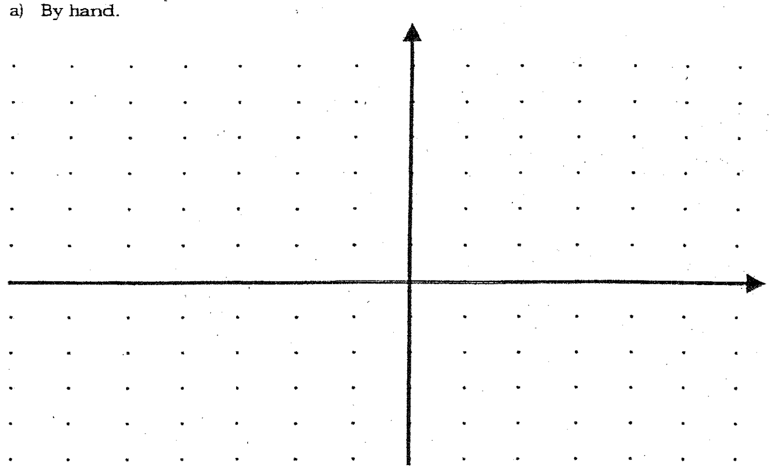
D(t) = { ....
....
....
....

c) Use the above equations to determine <u>algebraically</u> how far was Marge from her home (show your work)...

- 1.5 hours after she left home ....
- 2.5 hours after she left home ....
- 3.5 hours after she left home ....
- 4.5 hours after she left home ....

3. Graph: $f(x) = \begin{cases} x+2 & -6 < x < -3 \\ 4 & -3 \le x < 2 \\ -x+6 & 2 \le x \le 5 \end{cases}$ in the coordinate plane below.

a) By hand.



b) Evaluate algebraically. <u>Show your work</u>. Verify our answers from the graph.

f(-8) = ...

f(-6) = ...

f(-3) = ...

f(0) = ...

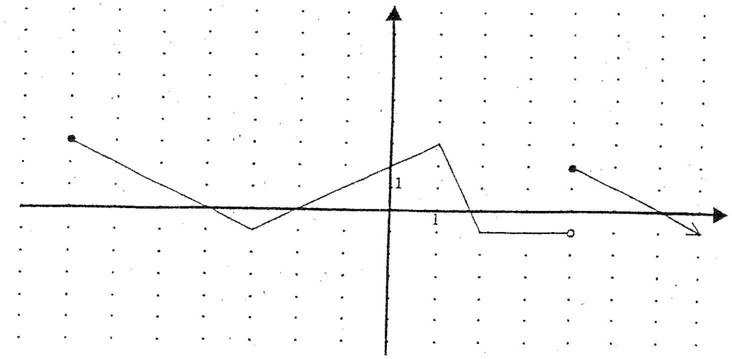
f(2) = ...

f(4) = ...

f(5) = ...

f(10) = ...

4. Determine the equations and their respective domains of the piecewise defined function depicted below.



$f(x) = \begin{cases} \text{..........} & \text{..........} \\ \text{..........} & \text{..........} \\ \text{..........} & \text{..........} \\ \text{..........} & \text{..........} \\ \text{..........} & \text{..........} \end{cases}$