

### 1.3 Linear Fcts

Ex1: Marriage rates are declining.

yr.	% of unmarried women who marry
1950	85.25
1951	84.5
1952	83.75
1953	83. ...

construct a linear model.

- define variables.
- model.
- int. y-int.
- int. the slope.
- find  $\epsilon$  int. the x-int.
- reasonable domain  $\epsilon$  range.

Linear Fct: Of the form  $f(x) = mx + b$  where  $m$   $\epsilon$   $b$  are constants.

ex2: Find the lin. fct. w/ slope =  $\frac{2}{3}$   $\epsilon$  y-int -1.

ex3: Eqn of the line thru (10, 2)  $\epsilon$  (8, 7)

parallel vs. perp. lines.

slope = 0 vs. und. slope.

ex4: R-11 is  $3\frac{1}{2}$ " thick

R-19 is  $5\frac{1}{2}$ " thick

How thick is R-51 if the relationship  
is linear?

Ex 3: A \$360,000 building is depreciating  
to a value of  $V(x)$  after  $x$  months  
w/  $V(x) = 360,000 - 1500x$ .

1.2B
2/2

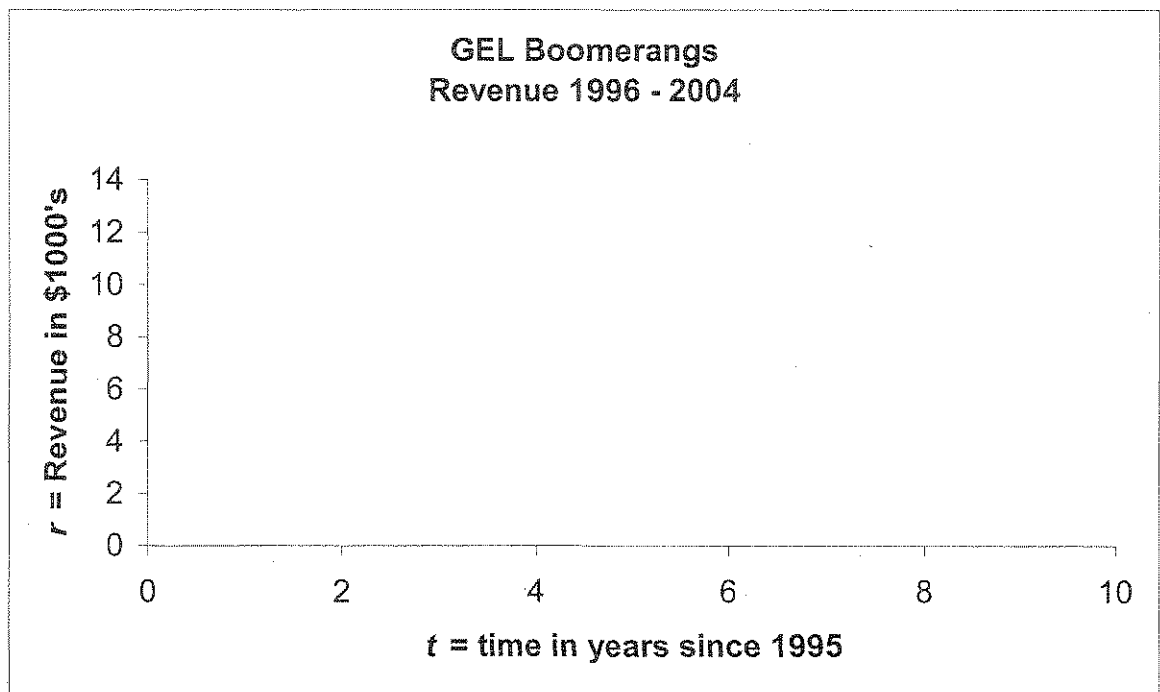
- Find  $\text{sr interp } V(0)$
- solve  $\text{sr interp } V(x) = 0$
- Interp the slope
- find a reasonable domain
- find a reasonable range.

**Instructions:** Answer each question using a complete sentence.

- 1.) What is the relationship between profit, cost, and revenue? \_\_\_\_\_
- 2.) Using this formula and the graphs previously given to describe profit and costs, complete the following table.

Function	$t=1$	2	3	4	5	6	7	8	9
Profit									
Cost									
Revenue									

- 3.) Carefully, plot points and sketch a smooth curve to generate a graph of GEL Boomerangs' Revenue from 1996 – 2004.

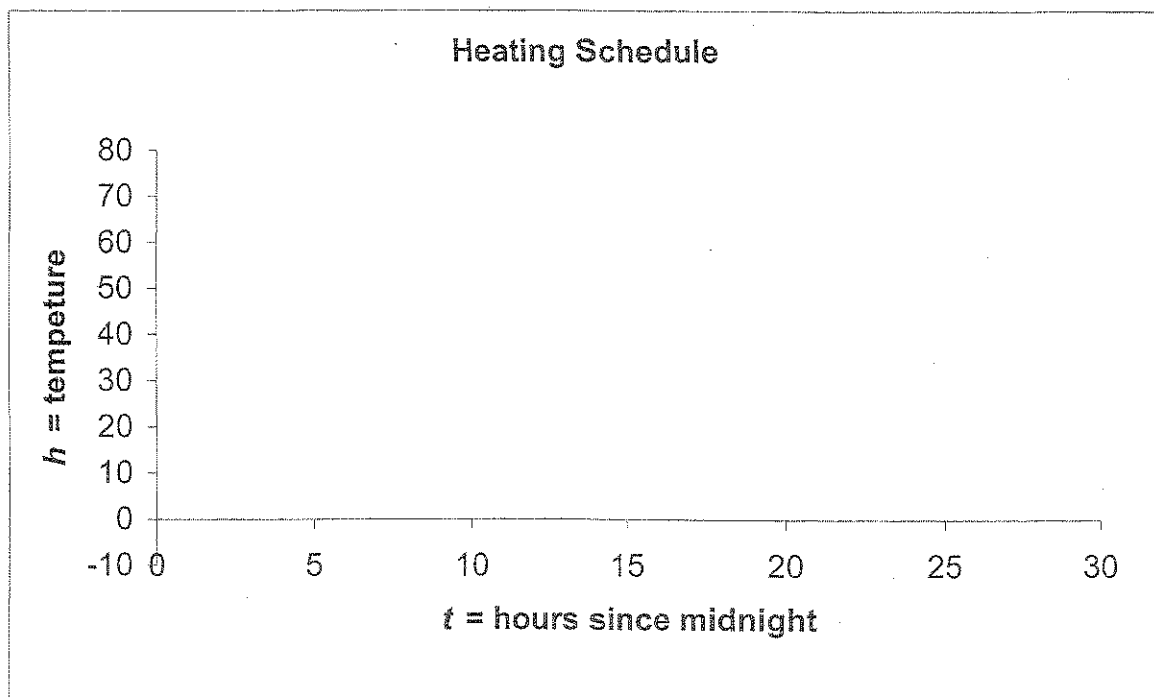


- 4.) Find and interpret  $r(7)$  \_\_\_\_\_
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- 5.) Solve and interpret  $r(t) = 7$ ? \_\_\_\_\_
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- 6.) Find and interpret  $r(5) - r(2)$ ? \_\_\_\_\_
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- 7.) Find and interpret  $\frac{r(5) - r(2)}{5 - 2}$ ? \_\_\_\_\_
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Consider the heating schedule of a certain office building where the temperature is a function of time.

Graph this function if:

- At midnight (time  $t = 0$ ), the building temperature is  $50^\circ\text{F}$ .
- This temperature is maintained until 4am.
- The temperature then warms up steadily so that by 8am the temperature is  $70^\circ\text{F}$ .
- The  $70^\circ\text{F}$  temperature is maintained until 4pm.
- The building then gradually cools to  $50^\circ\text{F}$  by 8pm.
- This temperature is maintained throughout the night.



- Suppose the building manager decides to change the heating schedule by starting it two hours earlier. How will the graph change?
- Suppose the building manager decided the temperature should be kept  $2^\circ\text{F}$  warmer. How will the graph change?
- If we consider  $h(t)$  the temperature as a function of time, interpret  $h(2)$  and  $h(4)$ .
- What happened in  $h(t+2)$ ? Interpret in the context of the question.
- What happened in  $h(t)+2$ ? Interpret in the context of the question.
- Interpret  $h(t)=60$  and  $h(t)=72$  in the context of the problem.