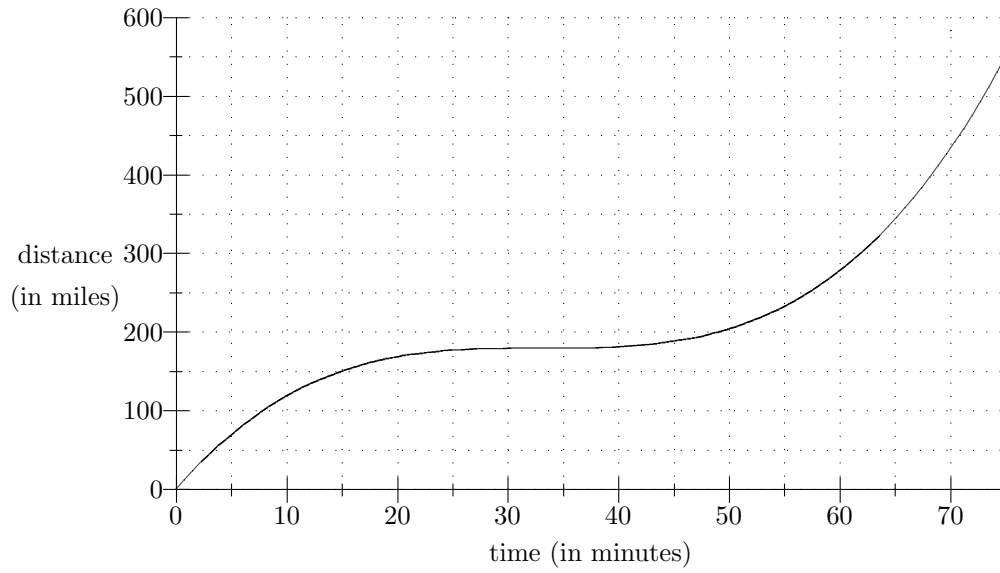
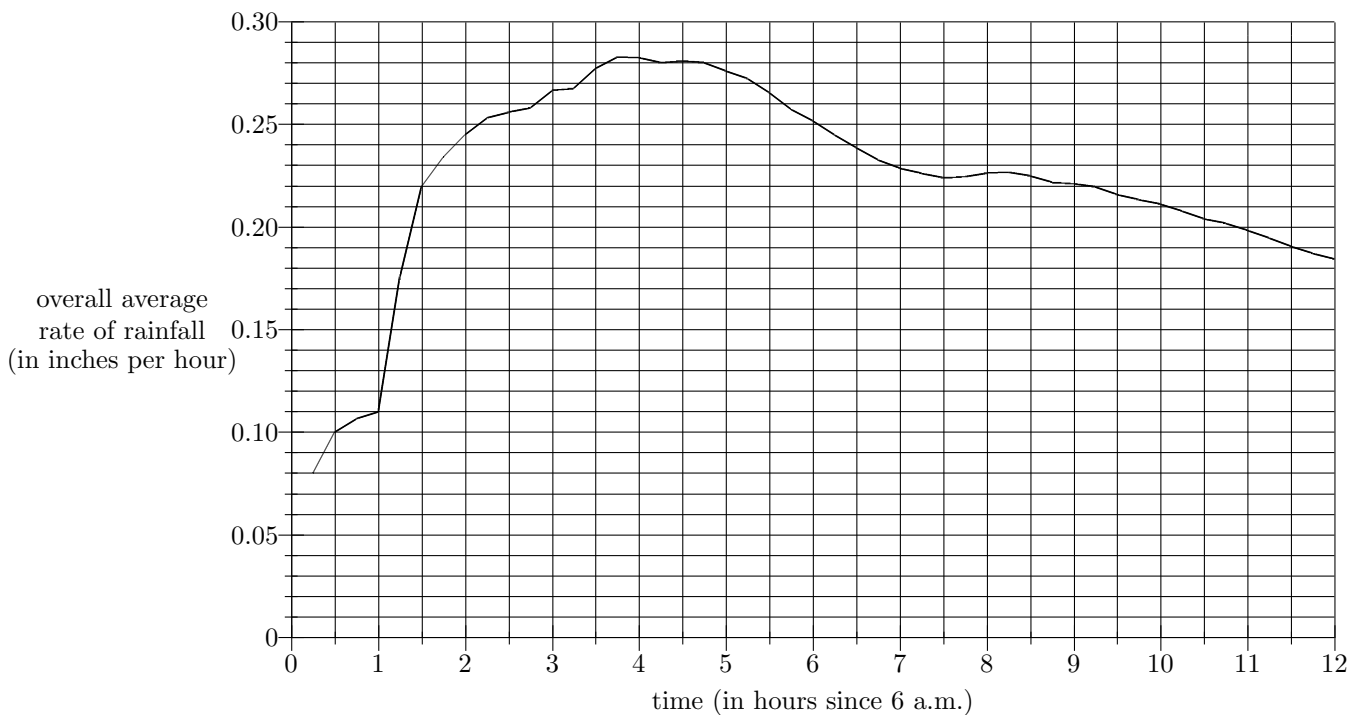


Handouts to accompany Worksheet #1

Situation I: The graph below is distance vs. time for a rocket car traveling on the rocket car freeway.



Situation II: The following is the graph of the **overall average rate of rainfall** over a twelve-hour period, beginning at 6 a.m. That is, the vertical axis gives the number of inches per hour that have been accumulated, on average, in the t hours since 6 a.m.



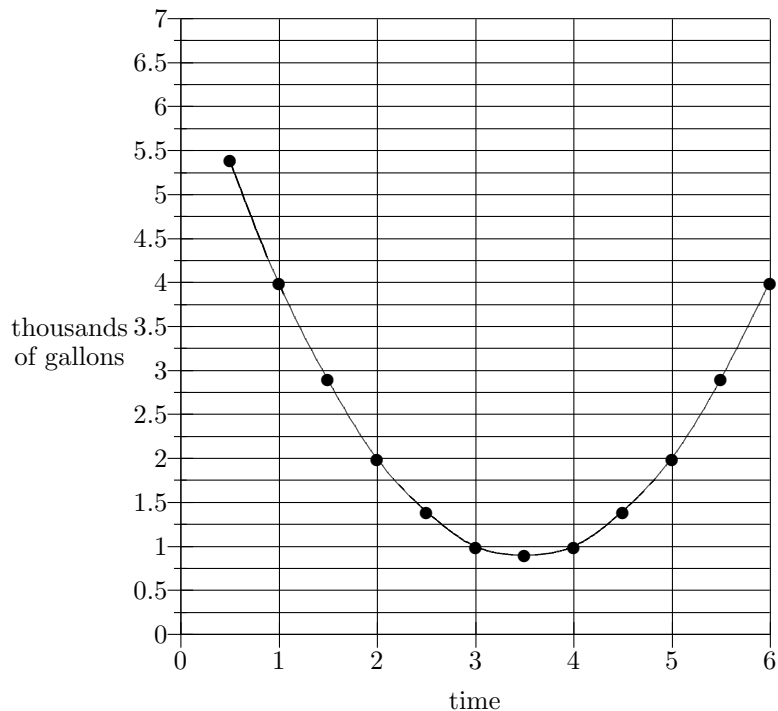
Questions:

1. Find all times at which the overall average rate of rainfall is 0.23 inches per hour.
2. Find the total amount of rain that had fallen by time $t = 5.5$.
3. How much rain fell from $t = 2$ to $t = 8$ hours?
4. What is the *incremental* average rate of rainfall from $t = 1$ to $t = 6$ hours?

Handouts to accompany Worksheet #2

Situation I: The chart and graph below show the amounts of water (in thousands of gallons) drawn from a city water reservoir by customers over half-hour intervals from noon to 6 p.m. Water flows in the reservoir at the constant rate of three thousand gallons per half hour.

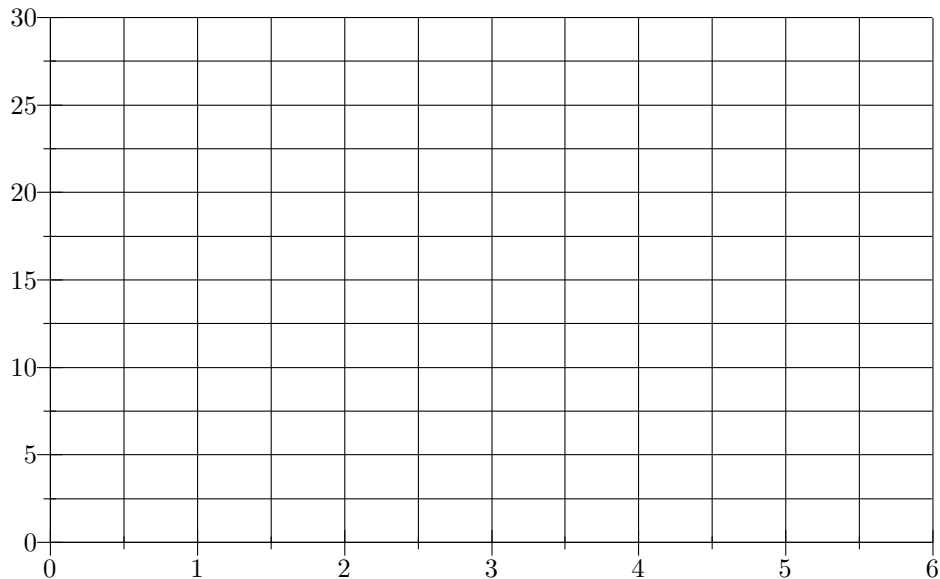
t	U
12:00	N/A
12:30	5.4
1:00	4
1:30	2.9
2:00	2
2:30	1.4
3:00	1
3:30	.9
4:00	1
4:30	1.4
5:00	2
5:30	2.9
6:00	4



Questions:

1. If the reservoir were empty at noon, could the customers be supplied with their water for the whole day?
2. If not, what would be a reasonable amount of water to have in the reservoir at noon to be sure that the customers can be sufficiently supplied?

t	12:30	1:00	1:30	2:00	2:30	3:00	3:30	4:00	4:30	5:00	5:30	6:00
U	5.4	4	2.9	2	1.4	1	.9	1	1.4	2	2.9	4
O												
I												



Situation II: A car moves along a long, straight road. The following chart shows the car's average speed over the ten-minute interval beginning at time t minutes.

interval starts at $t =$	0	10	20	30	40	50
AS (miles per minute)	0.75	0.89	1.02	0.99	1.04	0.78

Questions:

1. How far did the car travel from $t = 20$ to $t = 40$?
2. On average, how fast does the car go (in miles per minute) during the first 30 minutes of the trip?
3. Compute the car's average speed from $t = 30$ to $t = 60$.

Handout to accompany Worksheet #3

Situation: You produce and sell Things. In order to attract large orders, you have devised a sliding price scale, given in the table below. It costs \$6 to produce each Thing.

(1) quantity q	1	2	3	4	5	6	7	8	9
(2) price per Thing	20	18	16	14	12	10	8	6	4
(3)									
(4)									
(5)									
(6)									
(7)									

Handout to Accompany Worksheet #5

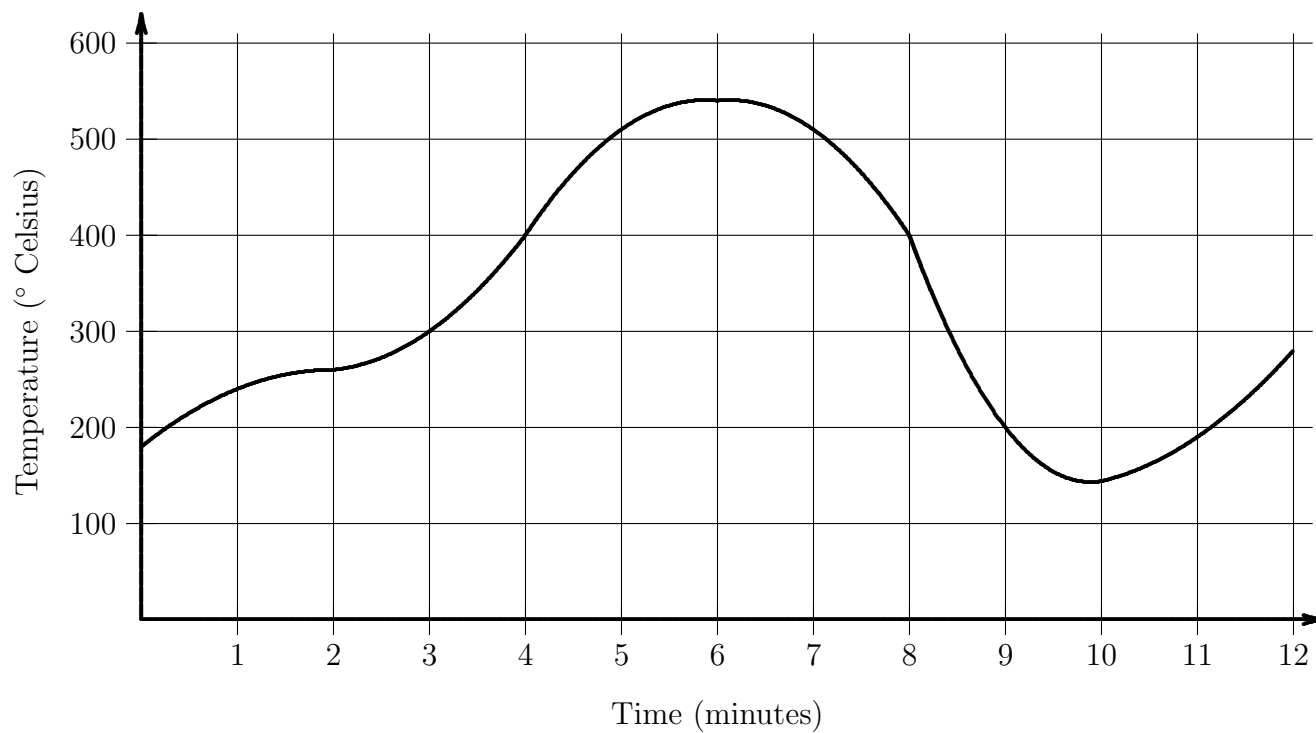
Situation: A yellow car and a green car travel down a long, straight road. At $t = 0$, both cars are at the same place (the starting line). Yellow's distance (in miles) is given in the table below:

t (in min)	0	5	10	15	20	25
Yellow	0	7.3	11.4	13.6	15.1	17.5
Green						

Green sits at the starting line and then, for every place along the highway, Green reaches that place exactly 5 minutes after Yellow does.

Handouts to accompany Worksheet #6

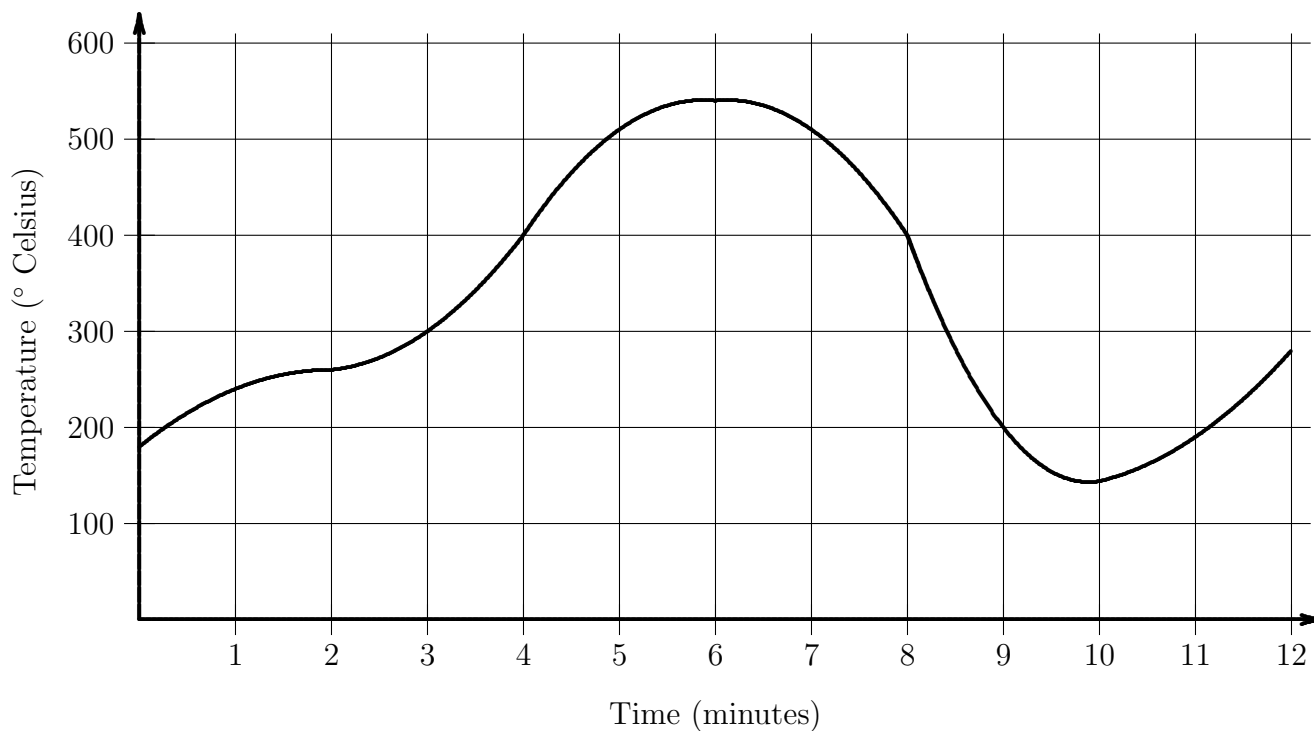
Situation: This is the graph of temperature vs. time for a chemical reaction.



	English	Graph	Functional Notation
1	At time $t = 4$, the temperature is 400° .	At $t = 4$, the height of graph is 400.	$P(4) = 400$
2			$P(b) - P(a)$
3	the incremental rate of change in temperature from time a to time b		
4		the “ y ”-intercept of the temperature graph	
5			$\frac{P(b)}{b}$
6			$\frac{P(b)-P(0)}{b-0}$
7			$P(10) > P(9)$ * * false
8	Between 4 and 6 minutes, the temperature rises by 140° .		
9		The slope of the secant from $t = 0$ to $t = 4$ is 57.	
10	When is the temperature 350° ?		
11		The graph has height 200 for three different values of t .	
12			Find t so that $P(t) - P(2) > 100$.
13	Find two times, 2 minutes apart, when the temperature is the same.		
14		slope of the secant line from 2 to h	

	English	Graph	Functional Notation
15	How many minutes after $t = 4$ does the temperature become 250° ?		
16			If $\Delta t = 3$, for what t is ΔP highest?
17		the change in height of the graph between t and $t + 2$	
18			Solve $P(3+r) - P(3) = 100$ for r
19		slope of secant line from t to $t + 3$.	
20	the average rate of change of temperature for h minutes beginning at $t = 3$		
21		slope of the secant from $t = p$ to $t = q$.	
22			Is $P(2) + P(3) = P(5)$?
23		For which t is graph twice as high as it is when $t = 10$?	
24	Find a span over which temp rises by $50^\circ/\text{min}$ on average.		
25			$\frac{P(5)-P(2)}{5-2} > \frac{P(8)-P(2)}{8-2}$

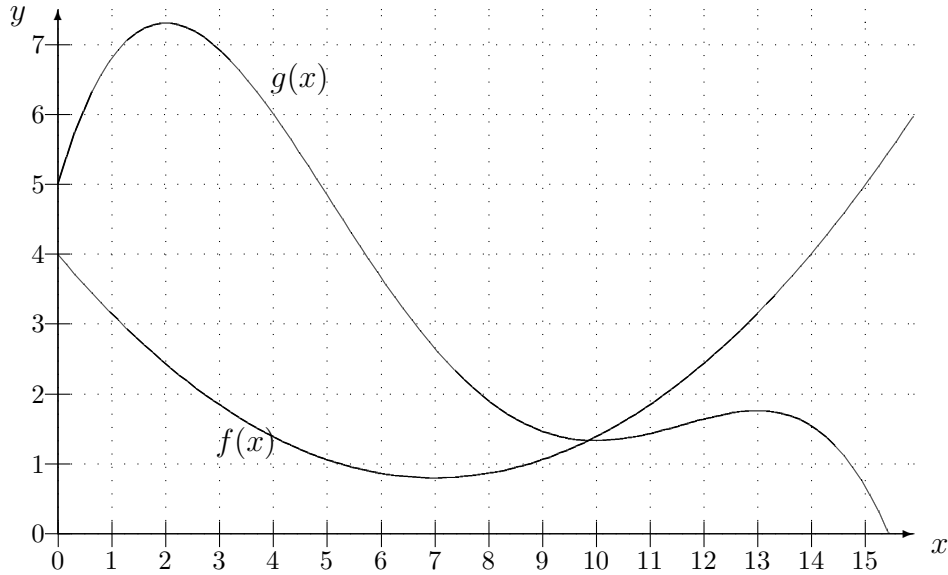
Situation I: This is the graph from the WS 6 handouts.



Questions:

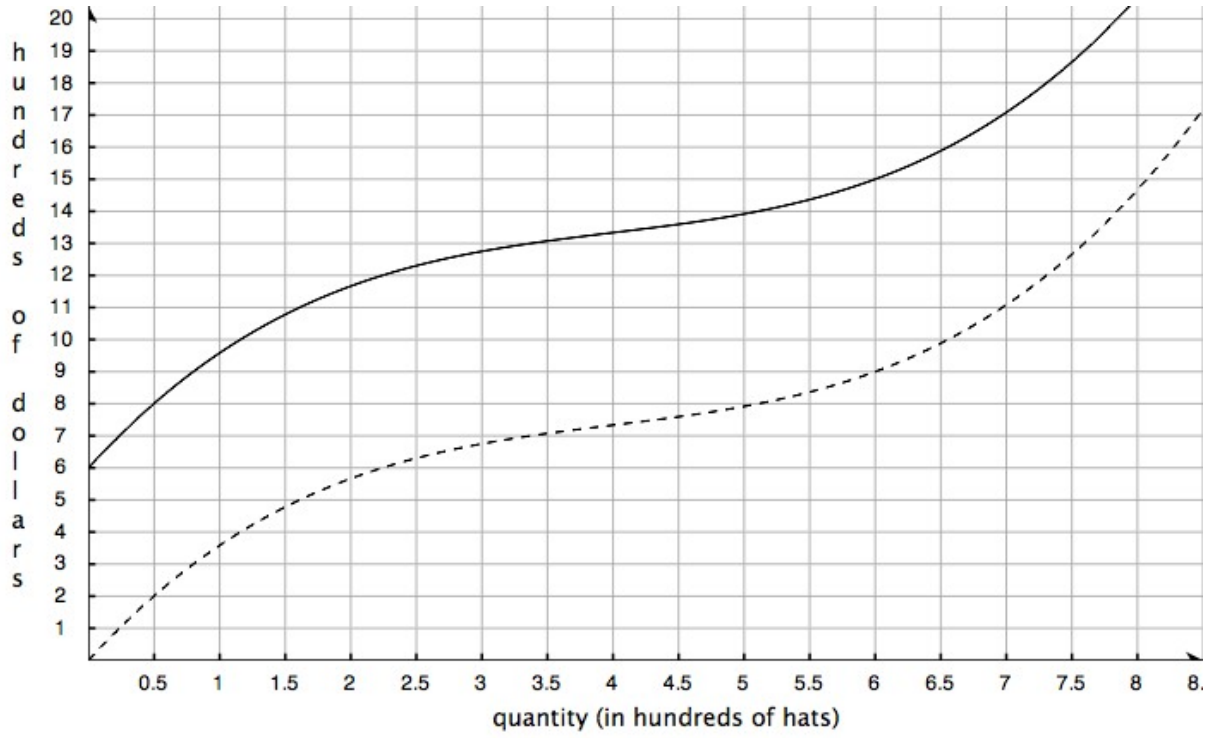
1. Find a time at which the overall rate of change of temperature is 25 degrees per minute.
2. Find a two-minute interval during which the incremental rate of change of temperature is 10 degrees per minute. (That is, find a two-minute interval over which the temperature rises, on average, 10 degrees per minute.)
3. Find a three-minute interval during which the temperature rises by 150 degrees.

Situation II: The graphs of $f(x)$ and $g(x)$ are given below.



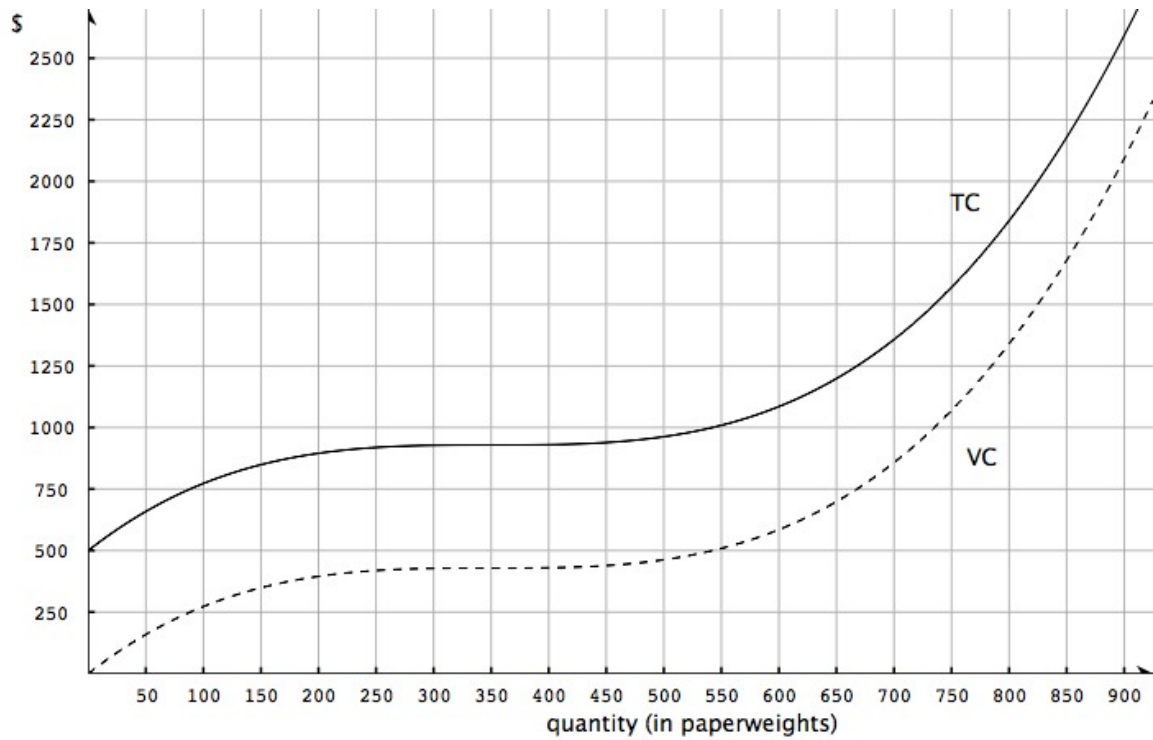
1. Find an x such that $\frac{f(x)}{x} = \frac{g(x)}{x}$.
2. Find an x such that $\frac{f(x) - f(5)}{x - 5} = 0$.
3. List all values of x at which $\frac{g(x + 0.01) - g(x)}{0.01} = 0$.
4. Find a value of x such that $f(x + 6) - f(x) = 3$.

Handout to accompany Worksheet #8

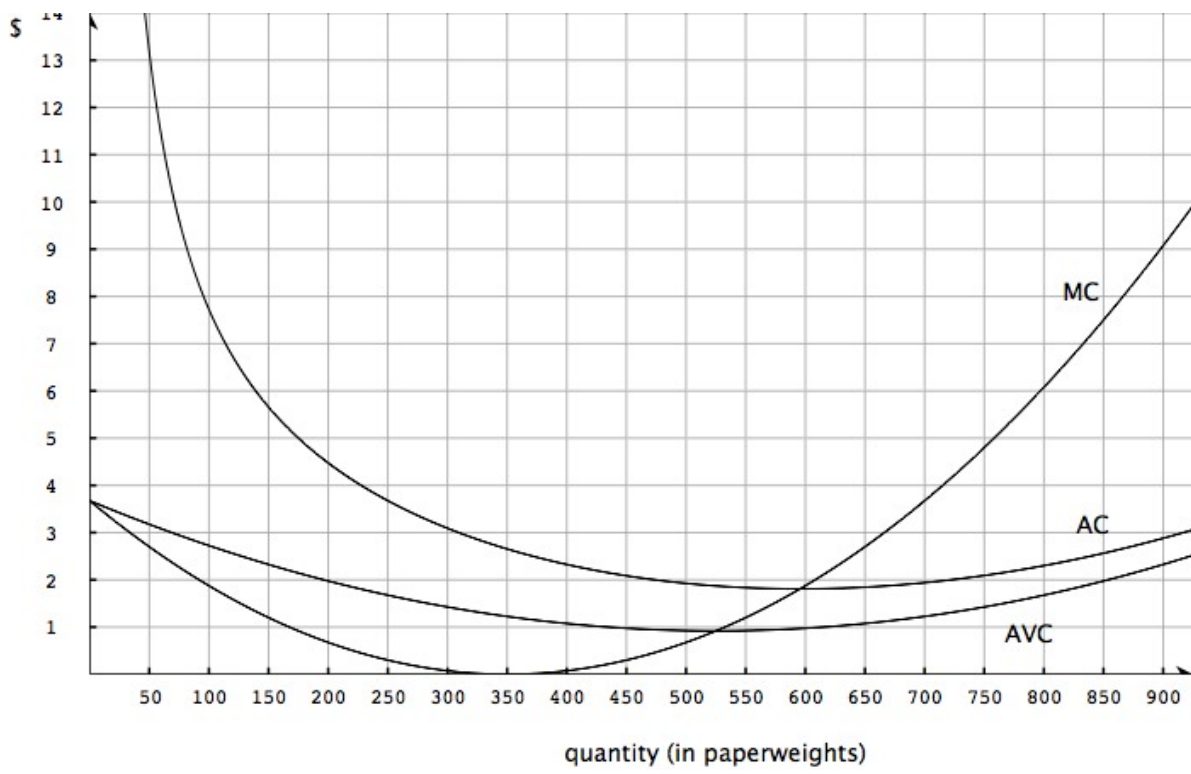


Handout to accompany Worksheet #9

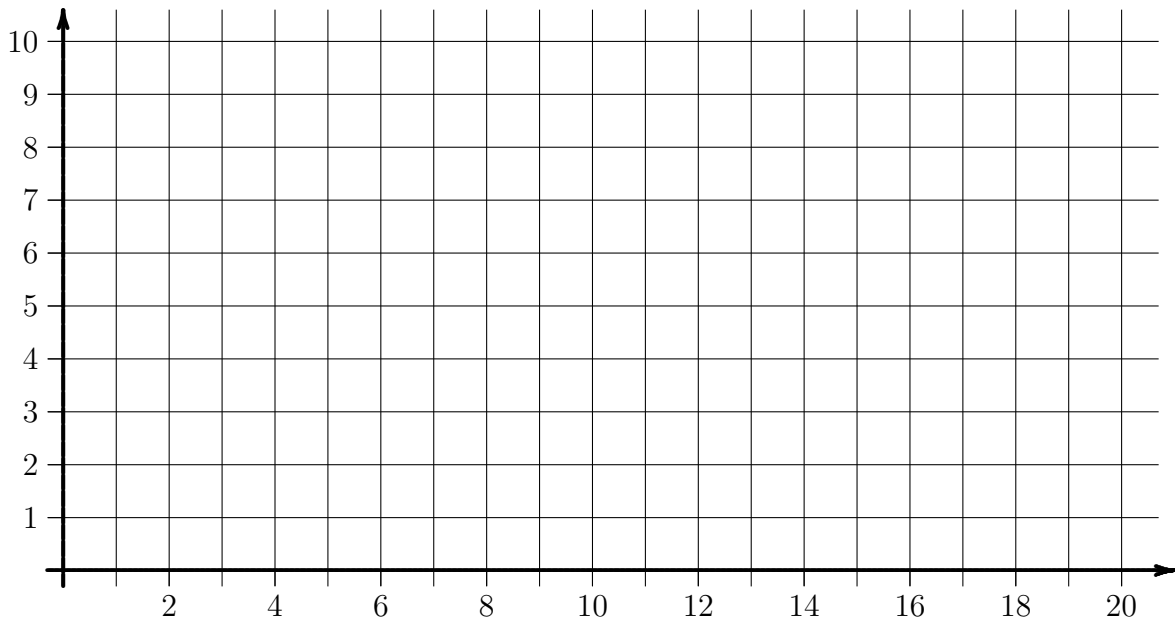
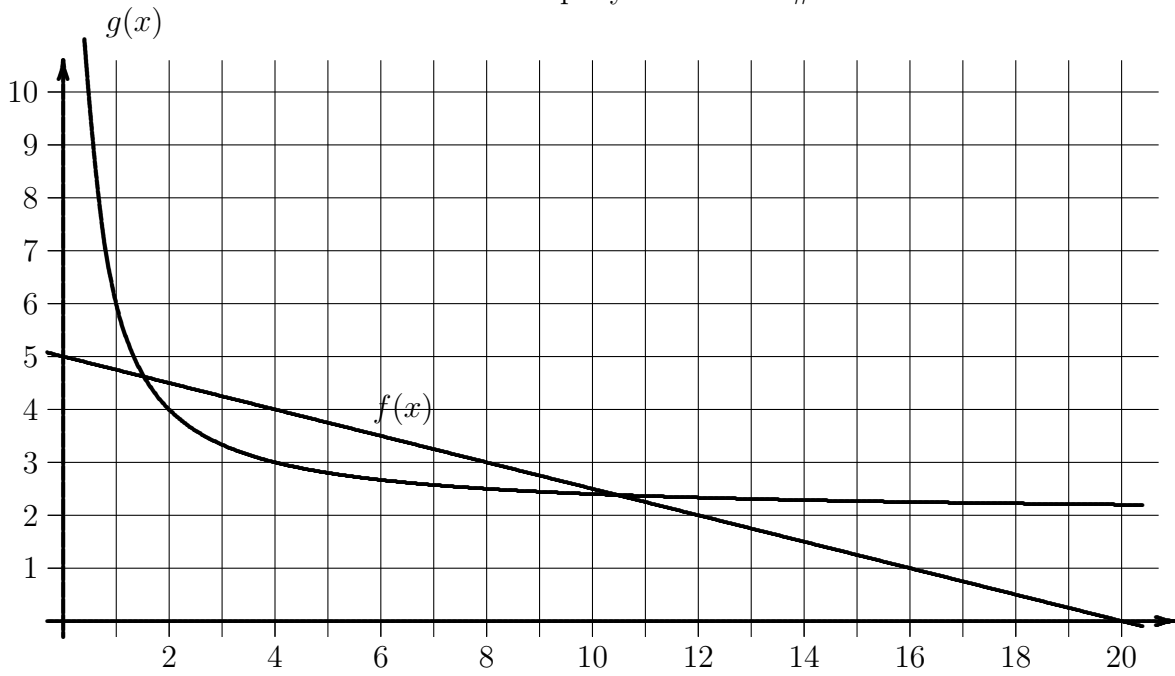
The following are the graphs of Total Cost and Variable Cost for selling paperweights.



q	100	200	300	400	500	600	700	800	900	1000
MC	1.88		0.08	0.08	0.68	1.88	3.68	6.08	9.08	12.68
AC	7.73	4.48		2.33	1.93	1.81	1.94	2.30	2.88	3.68
AVC	2.73	1.98	1.43	1.08	0.93	0.98		1.68	2.33	3.18

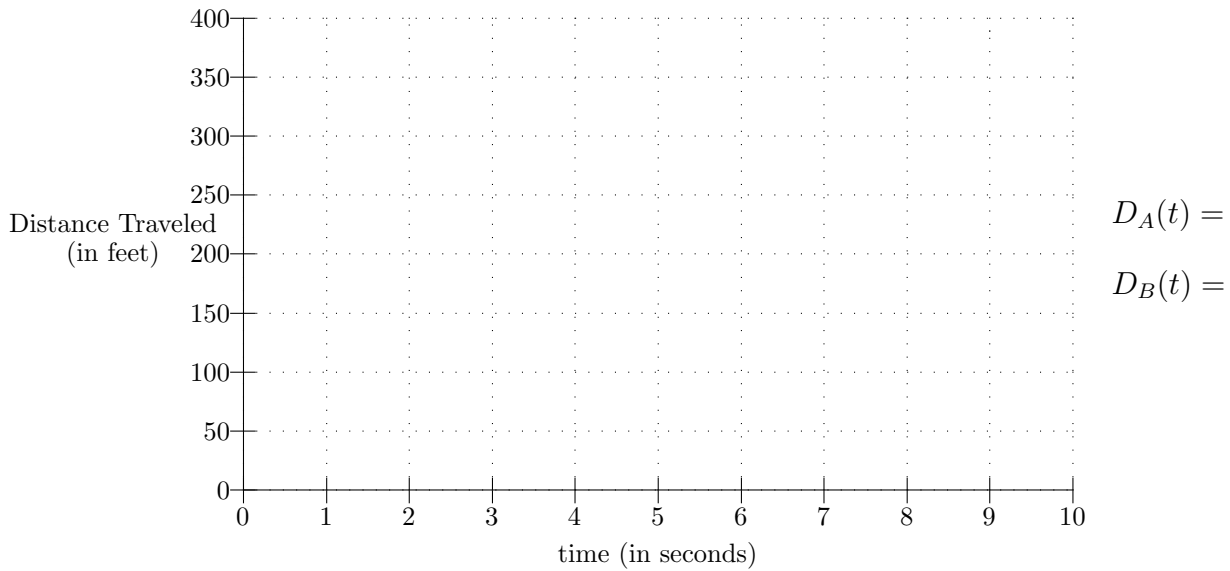
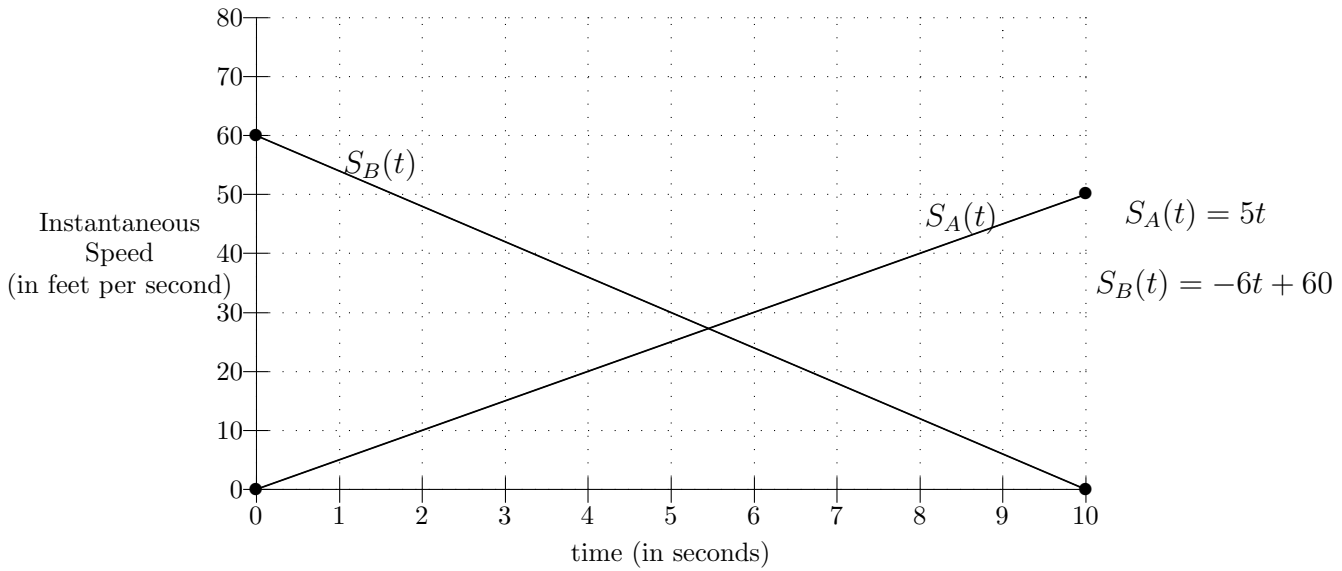


Handout to accompany Worksheet #14



Handout to accompany Worksheet #16

Story: The figure below gives the graphs of *instantaneous speed* for two cars, Car A and Car B. Assume that at time $t = 0$, the two cars are next to one another.



Handout to Accompany Worksheet #18

Story: Your Great Aunt Emmy dies, leaving you some money. However, she wants to make sure you understand how interest is compounded. So, you must choose between the following options.

Option A: An account is set up in your name and \$5000 is deposited in it. A deposit of \$5000 is made at the end of each year for the next 25 years. You get the money at the end of the 25th year, after the annual deposit has been made.

Option B: An account is set up in your name and \$5000 is deposited. At the end of each year, 14% of the current balance is credited to the account. You are given the balance at the end of the 25th year, after the interest has been credited.

Option C: Same as B, but with 6.5% of the balance credited every six months.

Goal: to choose the most lucrative option