Linear Algebra
The Mathematics of Weight Loss

Prof. Oaks has been on a diet since March 20. His goal is to weigh 225 lbs by October 31, 2013. Let $\mathbf{1}$ be a $n \times 1$ column vector of ones and let $\boldsymbol{x}$ be the $n \times 1$ column vector of his **weekly weight loss** so far. Using the information below, calculate $\mathbf{1}'\boldsymbol{x}(\mathbf{1}'\mathbf{1})^{-1}$ to help him figure out what his average weight loss each week has been over the 23 week period so far.

Week	Date	Weight
Start	Mar 20	275
1	Mar 27	272
2	Apr 3	270.4
3	Apr 10	268
4	Apr 17	266.6
5	Apr 24	265.4
6	May 1	263.8
7	May 8	262.4
8	May 15	260.6
9	May 22	257.6
10	May 29	256.6
11	Jun 5	255.4
12	Jun 12	255.2
13	Jun 19	253.2
14	Jun 26	251.6
15	Jul 3	250.6
16	Jul 10	249.8
17	Jul 17	249.2
18	Jul 24	248.6
19	Jul 31	247.6
20	Aug 7	248.2
21	Aug 14	245.8
22	Aug 21	244.0
23	Aug 28	243.4

Calculus
The Mathematics of Weight Loss

Prof. Oaks has been on a diet since March 20. His goal is to weigh 225 lbs by October 31, 2013. Using quadratic regression on the data below, a function to model his weight loss is:

$$f(x) = 0.311x^2 - 2.0233x + 274.37$$

Use the limit process to find the derivative of this function. What is the meaning of the derivative that you found? What was the instantaneous rate of change of his weight loss at week 11? Does this result make sense? Why or why not?

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14	Jun 26	251.6
15	Jul 3	250.6
16	Jul 10	249.8
17	Jul 17	249.2
18	Jul 24	248.6
19	Jul 31	247.6
20	Aug 7	248.2
21	Aug 14	245.8
22	Aug 21	244.0
23	Aug 28	243.4

Beginning Algebra
The Mathematics of Weight Loss

Prof. Oaks has been on a diet since March 20. His goal is to weigh 225 lbs by October 31, 2013. Let x be the amount of weight he still needs to lose. Using the information below, write and solve a linear equation to figure out how much more weight he needs to lose in order to reach his goal. Explain why you set-up the equation the way that you did.

Week	Date	Weight
Start	Mar 20	275
1	Mar 27	272
2	Apr 3	270.4
3	Apr 10	268
4	Apr 17	266.6
5	Apr 24	265.4
6	May 1	263.8
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Statistics
The Mathematics of Weight Loss

Prof. Oaks has been on a diet since March 20. His goal is to weigh 225 lbs by October 31, 2013. Using the information below, calculate what his average **weight loss each week** has been over the 23 week period so far.

Week	Date	Weight
Start	Mar 20	275
1	Mar 27	272
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Math for Education
The Mathematics of Weight Loss

Prof. Oaks has been on a diet since March 20. His goal is to weigh 225 lbs by October 31, 2013. Using the information below, how would you explain to a child how to figure out much more weight he needs to lose in order to reach his goal?

Week	Date	Weight
Start	Mar 20	275
1	Mar 27	272
2	Apr 3	270.4
3	Apr 10	268
4	Apr 17	266.6
5	Apr 24	265.4
6	May 1	263.8
7	May 8	262.4
8	May 15	260.6
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