Quiz 8 **Calculus 1** **4/11/2006**

Each problem is worth 5 points. Clear and complete justification is required for full credit.

1. Given the table of values below for the rate at which sediment is accumulating in a ditch t days after the beginning of the rainy season, find upper and lower approximations for the total amount of sediment which has accumulated after 3 days.

t (days)	0	1	2	3	4	5
r (inches/day)	0	4.2	4.5	0.7	-3.8	-4.8

upper = $1 \times 4.2 + 1 \times 4.5 + 1 \times 4.5 = 13.2$ inches

lower = $1 \times 0 + 1 \times 4.2 + 1 \times 0.7 = 4.9$ inches

Exactly

2. Set up an expression in sigma notation, in the form of equation 3 from the book, for the value of $\int_0^3 (10+5x)\,dx$.

$\Delta x = \frac{3}{n}$

right endpoint: $x_i = \frac{3}{n} \cdot i$

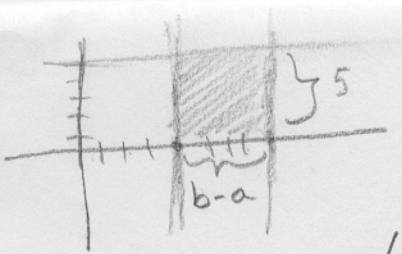
height: $f\left(\frac{3i}{n}\right) = \left[10 + 5\left(\frac{3i}{n}\right)\right]$

area: $\frac{3}{n} \cdot \left[10 + \frac{15i}{n}\right]$

total: $\sum_{i=1}^{n} \frac{3}{n}\left[10 + \frac{15i}{n}\right]$ simplified: $\sum_{i=1}^{n} \left[\frac{30}{n} + \frac{45i}{n^2}\right]$

Nice!

3. Evaluate $\int_4^8 5\,dx$.



area = $(b-a)c$

area = $(8-4)5$

$\int_4^8 5dx = 20$

Great