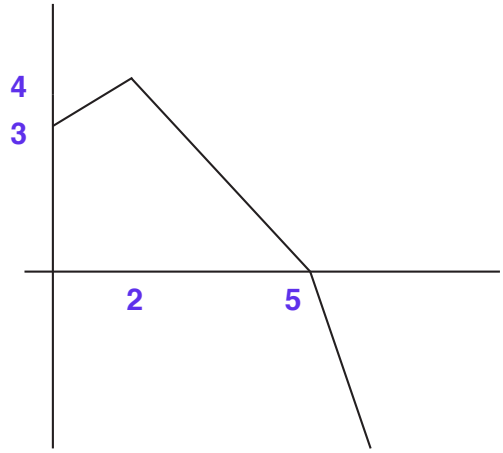
This is the third Exam from last fall. The usual caveats apply.

1. Below is the graph of a velocity function for a drone being operated by a person, such as myself, who has no idea what they are doing. Assume for the questions that the velocity is for straight up or down motion. Please answer each question.



a. (5 points) What is the maximum upward velocity?
b. (5 points) In the time interval illustrated, how far does the drone travel upwards?
c. (5 points) In the time interval illustrated, how far does the drone travel downwards?
d. (5 points) In the time interval illustrated, what is the drone's displacement?

2. Find the exact sum. (Hint: Write out the first few terms until the pattern is clear.)

$$\sum_{k=0}^{100} \left[\left(\frac{k}{k+1} \right) - \left(\frac{k+1}{k+2} \right) \right]$$

3. Evaluate the integral below until an integer is found. (Meaning, if your answer isn't an integer, there is an error.)

$$\int_{\ln(6)}^{\ln(8)} e^x \ dx$$

4. Evaluate the integral below. Simplify it as much as is sensible.

$$\int \frac{1}{(x-1)(x-2)(x-3)} \ dx$$

5. Evaluate the integral below. Simplify it as much as is sensible.

$$\int_6^8 \frac{1}{x^2-4} \ dx$$