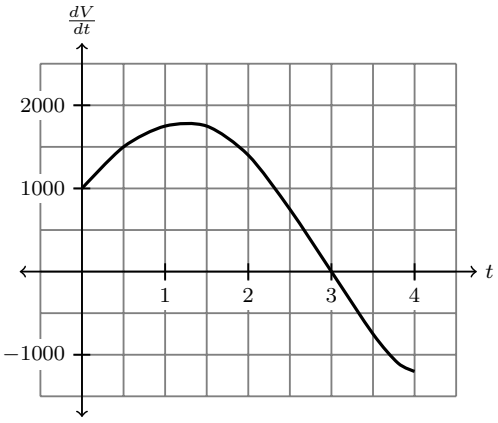
Author 1 _____

Author 2 _____

30 – Net Change & Substitution

Author 3 _____

1. The graph below shows the *rate of change* $\frac{dV}{dt}$ of the volume of water flowing in and out of a storage tank in liters/day. Assume that the tank was holding 25,000 L of water at the beginning of the first day ($t = 0$).



(a) Use an integral to express the *net change in the volume of water* from the beginning of the first day to the end of the fourth day.

(b) Use the midpoint rule with 4 subintervals to estimate the integral your the previous answer.

(c) In the previous two parts, you estimated the change in the volume of water. Can you use this to estimate the actual *volume of water* in the tank at the end of the fourth day?

2. Compute.

(a) $\displaystyle\int \cos(x)\sqrt{7+\sin(x)}\,dx$

(b) $\displaystyle\int \frac{3\sec^2(x)}{11+\tan(x)}\,dx$

3. Compute the area of the shaded region below.