Math 2B Worksheet: 5.4 The Net Change Theorem

Write your names and Student ID numbers at the top of the page

1. Evaluate the following.

    (a) $\int_0^2 |3x - 2|\, dx$

    (b) $\int_{-1}^2 |1 - x|\, dx$

2. Water flows from the bottom of a storage tank at a rate of $r(t) = 200 - 4t$ liters per minute, where $0 \le t \le 50$. Find the amount of water that flows from the tank during the first 10 minutes.

3. The velocity function for a particle moving along a line is given by $v(t) = t^2 - 2t - 3$, $2 \leq t \leq 4$. Find (a) the displacement of the particle, and (b) the distance traveled for the given time interval.

4. A population of honeybees starts with 100 bees and changes at a rate of $n'(t)$ bees per week.

   (a) What does $\int_0^{15} |n'(t)| \, dt$ represent?

   (b) What does $100 + \int_0^{15} n'(t) \, dt$ represent?