Math 10A with Professor Stankova
Worksheet, Discussion #17; Wednesday, 10/4/2017
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Anti-Derivative Word Problems

Example

1. I throw a ball up into the air with an initial velocity of $10m/s$. Assuming that gravity produces a constant acceleration of $-10m/s^2$, how long will it take for the ball to come back to the ground?

Problems

2. An airplane starts accelerating at a rate of $4m/s^2$. After 20 seconds, it finally lifts off the ground. How far did it travel before takeoff?

3. A ball is dropped from a height of $500m$. Assuming gravity is $-10m/s^2$, how long does it take for the ball to hit the ground?

4. A biker is initially traveling $45m/s$ and starts braking with a constant deceleration of $9m/s^2$. How far does he go before he comes to a complete stop?

5. In t months from now, the population of Berkeley will be changing at a rate of $25+10t^{2/3}$. If the current population is 2000, what is the population 8 months from now?

6. In t seconds, a bacteria population will be increasing at a rate of $50e^{5t}$. If the initial bacteria population is 200, what will it be in 10 seconds?

7. An atom is losing energy at a rate of $10J/s$. If the atom initially has $100J$ worth of energy, how much energy will it have after 5 seconds?

Riemann Sums

Example

8. Using limits, find the integral of x^2 from 0 to 3.