Exam 1 Practice covering 5.1-5.6

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Name:

Date:

Please work the following problems on your own paper in order. Only name and date need be on this page.

The following formulas may be helpful with some of the problems.

$$\sum_{i=1}^{n} i = \frac{n(n+1)}{2} = \frac{n^2}{2} + \frac{n}{2} \qquad\qquad \sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6} = \frac{n^3}{3} + \frac{n^2}{2} + \frac{n}{6}$$

$$\sum_{i=1}^{n} i^3 = \frac{n^2(n+1)^2}{4} = \frac{n^4}{4} + \frac{n^3}{2} + \frac{n^2}{4} \qquad R_n = \lim_{n \to \infty} \sum_{i=1}^{n} f(a + \Delta xi)\Delta x$$

1. $\int \dfrac{3x^2 - 2x + 1}{x}\, dx$

2. $f''(x) = 16 - 7x, f'(1) = 2, f(2) = 4$. Find $f'(x)$ and $f(x)$.

3. Find the R_4 approximation for $\displaystyle\int_{5}^{17} (2x - 5)\,dx$

4. A stone was dropped off a cliff and hit the ground with a speed of 360 ft/s. What is the height of the cliff? (Use acceleration due to gravity of $-32\ ft/s^2$)

5. Use geometry (show drawing with any signed area regions) to find $\displaystyle\int_{-2}^{5} \left(|x| - 2\right) dx$

6. Use the Riemann sum formula to find $\displaystyle\int_{-2}^{5} (3x^2 - x + 2)\,dx$

7. Determine $\displaystyle\sum_{i=50}^{88} 3i^3 - 9i^2 + i$

8. $\displaystyle\int_{-1}^{6} |2x - 7|\,dx$

9. Determine $\dfrac{d}{dx}\displaystyle\int_{5x^2}^{5} 6\sin(t^2)\,dt$

10. If $v(t) = 68.6 - 9.8t$ ft/s, find the displacement and total distance traveled during the first 15 seconds by an object.

11. If a car has constant deceleration, determine how many feet the car travels from the point it applies it brakes (when it was traveling 80mph) till it comes to a stop 5 seconds later.