Magnet Analysis 1A Name___________________________
Rose

Integrals and Riemann Sums

1. $\lim\limits_{n\to\infty}\frac{1}{n}\left[\frac{1}{n^2}+\left(\frac{2}{n}\right)^2+\left(\frac{3}{n}\right)^2+\ldots+\left(\frac{n}{n}\right)^2\right]=$

2. $\lim\limits_{n\to\infty}\frac{1}{n}\left[\left(\frac{1}{n}\right)^{1/2}+\left(\frac{2}{n}\right)^{1/2}+\left(\frac{3}{n}\right)^{1/2}+\ldots+\left(\frac{2n}{n}\right)^{1/2}\right]=$

3. $\lim\limits_{n\to\infty}\frac{1}{n}\left[\frac{1}{n}+\frac{2}{n}+\ldots+\frac{5n}{n}\right]=$

4. $\lim\limits_{n\to\infty}\frac{1}{n}\left[\left(\frac{2}{n}\right)^2+\left(\frac{4}{n}\right)^2+\ldots+\left(\frac{8n}{n}\right)^2\right]=$

5. $\lim\limits_{n\to\infty}\frac{1}{n}\left[\left(\frac{n}{1}\right)^2+\left(\frac{n}{2}\right)^2+\ldots+\left(\frac{n}{n}\right)^2\right]=$

6. If $\int_a^b f(x)dx = a + 2b$, then $\int_a^b \left(f(x)+5\right) dx =$

7. The expression $\frac{1}{50}\left(\sqrt{\frac{1}{50}}+\sqrt{\frac{2}{50}}+\sqrt{\frac{3}{50}}+...+\sqrt{\frac{50}{50}}\right)$ is a Riemann sum approximation for what integral?

8. If $\int_a^b f(x)dx = 5$ and $\int_a^b g(x)dx = -1$, which of the following must be true:

I. $f(x) > g(x)$ for $a \le x \le b$

II. $\int_a^b [f(x)+g(x)]dx = 4$

III. $\int_a^b [f(x)g(x)]dx = -5$

9. Use your calculator to give a decimal approximation for $\int_1^{500}\left(13^x - 11^x\right)dx + \int_2^{500}\left(11^x - 13^x\right)dx$

10. Express the following limits of Reimann Sums as integrals:

$$\lim_{n\to\infty}\sum_{i=1}^{n}\left[\frac{i}{n}+\left(\frac{i}{n}\right)^2\right]\frac{1}{n}$$

$$\lim_{n\to\infty}\sum_{i=1}^{n}\sqrt{\frac{1}{n^2}\left(1+\frac{2i}{n}\right)}$$

11. Without computation, show that

$$2\le\int_0^2\sqrt{1+x^3}\,dx\le 6$$

12. If $f(x)$ is odd and $\int_{-2}^{5} f(x)dx=8$, find $\int_{2}^{5} f(x)dx$.

13. If $f(x)$ is even, $\int_{-2}^{2} f(x)dx=6$, and $\int_{-5}^{5} f(x)dx=14$, then find $\int_{2}^{5} f(x)dx$.