6.3 Summation Notation

Calculus Name: _____ **CA #2**

Write a definite integral that is equivalent to the given summation notation. The lower limit for the integral is also given to help you get started.

1. Integral's lower limit $= -1$

$$\lim_{n\to\infty}\sum_{k=1}^{n}\left(\frac{2}{n}\right)\left(-1+\frac{2k}{n}\right)^4$$

2. Integral's lower limit $= -7$

$$\lim_{n\to\infty}\sum_{k=1}^{n}\left(\frac{4}{n}\right)\cos\left(-7+\frac{4k}{n}\right)$$

Write a summation notation equivalent to the definite integral.

3. $\int_1^4 \frac{1}{x^3}\,dx$

4. $\int_{-1}^{2} e^x\,dx$

5. Which of the following expressions is equal to $\lim_{n\to\infty}\frac{3}{n}\left(\sin\left(7+\frac{3}{n}\right)+\sin\left(7+\frac{6}{n}\right)+\sin\left(7+\frac{9}{n}\right)+\cdots+\sin\left(7+\frac{3n}{n}\right)\right)$?

(A) $\int_0^3 \sin(x)\,dx$ (B) $\int_0^3 7+\sin(x)\,dx$

(C) $\int_7^{10} \sin(x)\,dx$ (D) $\int_7^{10} \sin(7+x)\,dx$

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6. The expression $\frac{1}{100}\left(\left(\frac{1}{100}\right)^3+\left(\frac{2}{100}\right)^3+\left(\frac{3}{100}\right)^3+\cdots+\left(\frac{100}{100}\right)^3\right)$ is a Riemann sum approximation of which of the following integrals?

(A) $\int_0^1 \left(\frac{x}{100}\right)^3 dx$ (B) $\frac{1}{100}\int_0^1 \left(\frac{x}{100}\right)^3 dx$

(C) $\frac{1}{100}\int_0^1 x^3\,dx$ (D) $\frac{1}{100}\int_0^{100} x^3\,dx$ (E) $\int_0^1 x^3\,dx$

Answers to 6.3 CA #2

1. $\int_{-1}^{1} x^4\,dx$	2. $\int_{-7}^{-3} \cos(x)\,dx$	3. $\lim_{n\to\infty}\sum_{k=1}^{n}\left(\frac{3}{n}\right)\left(\frac{1}{\left(1+\frac{3k}{n}\right)^3}\right)$
4. $\lim_{n\to\infty}\sum_{k=1}^{n}\left(\frac{3}{n}\right)e^{-1+\frac{3k}{n}}$	5. $\int_7^{10} \sin(x)\,dx$	6. $\int_0^1 x^3\,dx$