30. Which of the following limits is equal to $\int_2^5 x^2\,dx$?

(A) $\lim\limits_{n\to\infty} \sum\limits_{k=1}^{n} \left(2+\frac{k}{n}\right)^2 \frac{1}{n}$

(B) $\lim\limits_{n\to\infty} \sum\limits_{k=1}^{n} \left(2+\frac{k}{n}\right)^2 \frac{3}{n}$

(C) $\lim\limits_{n\to\infty} \sum\limits_{k=1}^{n} \left(2+\frac{3k}{n}\right)^2 \frac{1}{n}$

(D) $\lim\limits_{n\to\infty} \sum\limits_{k=1}^{n} \left(2+\frac{3k}{n}\right)^2 \frac{3}{n}$

30. For what value of b does the integral $\int_1^b x^2\,dx$ equal $\lim\limits_{n\to\infty} \sum\limits_{k=1}^{n} \left(1+\frac{2k}{n}\right)^2 \frac{2}{n}$?

(A) $b = 2$ only

(B) $b = 3$ only

(C) b could be any real number.

(D) There is no such value of b

For which of the following integrals is $\sum_{k=1}^{n} \ln\left(2+\frac{5}{n}k\right)\frac{5}{n}$ the right Riemann sum approximation with n subintervals of equal length?

(A) $\int_{2}^{7} \ln(x)dx$

(B) $\int_{2}^{7} \ln(2+x)dx$

(C) $\int_{0}^{5} \ln(2+5x)dx$

(D) $\int_{2}^{7} \ln(2+5x)dx$

Which of the following is equivalent to the definite integral $\int_2^6 \sqrt{x}dx$?

(A) $\lim_{n\to\infty}\sum_{k=1}^{n}\frac{4}{n}\sqrt{\frac{4k}{n}}$

(B) $\lim_{n\to\infty}\sum_{k=1}^{n}\frac{6}{n}\sqrt{\frac{6k}{n}}$

(C) $\lim_{n\to\infty}\sum_{k=1}^{n}\frac{4}{n}\sqrt{2+\frac{4k}{n}}$

(D) $\lim_{n\to\infty}\sum_{k=1}^{n}\frac{6}{n}\sqrt{2+\frac{6k}{n}}$

$\lim_{n\to\infty}\sum_{k=1}^{n}\left(\frac{3}{n}k\right)^2\left(\frac{3}{n}\right)$ is

(A) 1

(B) 3

(C) 9

(D) nonexistent

Which of the following expressions is equal to $\lim_{n\to\infty} \frac{1}{n}\left(\frac{1}{2+\frac{1}{n}}+\frac{1}{2+\frac{2}{n}}+\frac{1}{2+\frac{3}{n}}+\cdots+\frac{1}{2+\frac{n}{n}}\right)$?

(A) $\int_1^2 \frac{1}{x}dx$

(B) $\int_0^1 \frac{1}{2+x}dx$

(C) $\int_0^2 \frac{1}{2+x}dx$

(D) $\int_2^3 \frac{1}{2+x}dx$