Problem Set
Section: 5.2

Problem 1

If R_n is the Riemann sum for $f(x) = 4 + \frac{x^2}{8}, 0 \leq x \leq 4$ with n subintervals and taking sample points to be the right end points, then $R_n =$

Problem 2

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

(A) $\int_1^2 \cos(1+x^2)dx.$

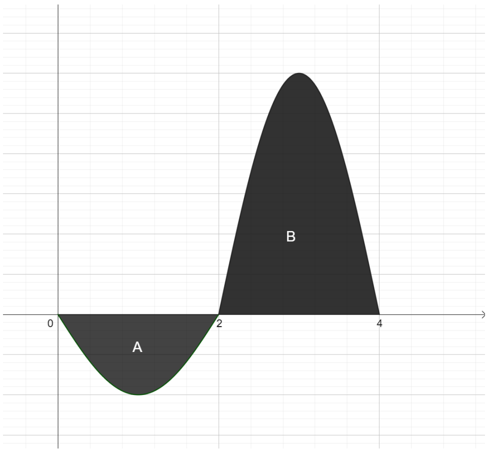
(B) $\int_1^2 \cos(x^2)dx.$

(C) $\int_1^2 \cos^2(x)dx.$

(D) $\int_0^1 \cos(x^2)dx.$

(E) $\int_0^1 \cos(1+x^2)dx.$

Problem 3



In the figure shown, regions A and B are bounded by the graph of a function f and the x-axis. If the area of region A is $\frac{1}{6}$ and the area of the region B is $\frac{3}{8}$, then

$$\int_0^4 f(x)dx + \int_0^4 |f(x)|dx =$$

Problem 4

If $\int_{-5}^{7} f(x)dx = -17$, $\int_{-5}^{11} f(x)dx = 32$, and $\int_{8}^{7} f(x)dx = 5$, then $\int_{11}^{8} f(x)dx =$.

Problem 5

If $f(x) = \begin{cases} -x; & -4 \leq x < 0 \\ \sqrt{4 - x^2}; & 0 \leq x \leq 2 \end{cases}$, then the value of the integral $\int_{-4}^{2} f(x)dx$ by interpreting in terms of area(s) is.

Problem 6

Write the limit as an integral (do not evaluate)

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

Problem 7

$\lim_{n\to\infty} \frac{2}{n^4}(1+8+27+\cdots+n^3) =$

Problem 8

If f is continuous function and

$$2 \leq f(x) \leq 5 \quad \text{for} \quad 3 \leq x \leq 9,$$

then ONE of the following statements is **FALSE**

(A) $\int_3^9 |f(x)|\,dx \geq 12$

(B) $\int_3^9 (3 - f(x))\,dx \geq -12$

(C) $\int_3^9 (1 - |f(x)|)\,dx \geq -10$

(D) $\int_3^9 -2f(x)dx \leq -24$

(E) $\int_3^9 (f(x))^2\,dx \geq 24$