Quiz 8.2 – The Definition of Net Area

1. **(1 pt) alfredLibrary/AUCI/chapter8/lesson2/quiz-/rightriemannsum12pet.pg**

To compute $\int_a^b f(x)dx$ using a Riemann sum and the definition of the definite integral, we first divide the interval $[a,b]$ into n subintervals of equal width Δx. Then we choose any point x_k^* in the k^{th} subinterval $[x_{k-1},x_k]$. Common choices include left-hand endpoints, midpoints, and right-hand endpoints:

LH : $x_k^* = a+(k-1)\Delta x$
Mid : $x_k^* = a+(k-\frac{1}{2})\Delta x$
RH : $x_k^* = a+k\Delta x$

We will use a right hand Riemann sum to compute $\int_{-8}^{-7.5} 18x^2 dx$.

(a) For n subintervals, the width of each subinterval is

$\Delta x =$ ________.

(b) If we substitute the lower limit a and Δx into the formula for right-hand endpoints given above, we obtain

$x_k^* =$ ________ for $k = 1,2,3,\ldots,n$.

(c) The height of the k^{th} rectangle is

$f(x_k^*) =$ ________

(d) The area of the k^{th} rectangle is (as powers of k)

$f(x_k^*)\Delta x =$ ________

$=$ ______ $+$ ______ $k+$ ______ k^2

(e) The right hand Riemann sum is given by

$R_n = \sum_{k=1}^{n} f(x_k^*)\Delta x$

$=$ ________ $\sum_{k=1}^{n} 1+$ ________ $\sum_{k=1}^{n} k+$ ________ $\sum_{k=1}^{n} k^2$

$=$ ________ $+$ ________ $+$ ________

(f) Finally,

$\int_{-8}^{-7.5} 18x^2 dx = \lim_{n\to\infty} \sum_{k=1}^{n} f(x_k^*)\Delta x =$ ________

2. **(1 pt) alfredLibrary/AUCI/chapter8/lesson2/quiz/defintegral1pet.pg**

Use the properties of the definite integral to evaluate $\int_0^{16} |x-8|\,dx$.

Answer: ________