

Please turn in the following problems.

5.1: 26

5.2: 11, 14, 31, 35

5.3: 2, 6, 14, 17(a), 17(b)(ii), 24

Chapter 5 Review: 40

Past exam questions:

I. Consider the graph of the function $g(x) = \sin x$ between $x = 0$ and $x = \pi$ radians.

1. Calculate the left-hand sum with $n = 3$ rectangles (a.k.a. LHS_3) for the area under the graph of $f(x)$ over this domain. You must write out your calculation in full. No calculator.
2. Draw one or more pictures to explain why the quantity

$$\frac{LHS_3 + RHS_3}{2}$$

must equal the number you calculated in part (a). Only pictures and words (and/or symbols) are acceptable. No further calculations.

3. Without doing any further calculations, fill in the blank with one of the symbols $<$, $>$, or $=$:

$$MPS_3 \text{ ______ } RHS_3.$$

4. *Briefly* explain your answer to part (c). (Hint: You may find it helpful to refer to your answer to part (b) of this question, as well as to the concavity of $g(x)$.)

II. Consider the Riemann sum

$$\sum_{k=0}^{9999} \left(e^{-(9+0.002k)^2} - 6(9+0.002k)^2 \right) \times 0.002$$

1. Is this a left hand sum, right hand sum, midpoint sum, or something else?
2. How many terms are in the sum? (i.e. what is n ?)
3. By first finding Δx , a , and b , write down the definite integral this sum approximates.
4. Is the following sum greater than, less than, or equal to the one above? Justify your answer.

$$\sum_{k=0}^{99999} \left(e^{-(9+0.0002k)^2} - 6(9+0.0002k)^2 \right) \times 0.0002$$