

Name: _____

Quiz 7 (Version A)

Instructions: This quiz is closed book, closed note, and an individual effort. Electronic devices other than approved calculators are not allowed on your person (e.g., no cell phones or calculators with CAS). Answer each question. **Show all work to receive full credit.** Unless the question specifies, you may provide either an exact answer or round to two decimal places. If you get stuck, please attempt to explain what you want to do. This may give more partial credit.

WRITE THIS PARAGRAPH ON WHAT YOU SUBMIT ALONG WITH A SIGNATURE AND DATE.

I, _____, will not under any circumstance use an online source, my peers, my notes, or any other resource besides my own knowledge and a calculator reset to factory settings to complete this exam. I will show all my work to demonstrate my knowledge on the topic.

Signature: _____

Date: _____

1. (2 points each) Approximate the following integrals with a left-hand sum and a right-hand sum with $n = 3$ subdivisions. Determine for each which is an overestimate and which is an underestimate.

(a) $\int_1^4 3x^2 dx$

(b) $\int_0^3 e^{x^2} dx$

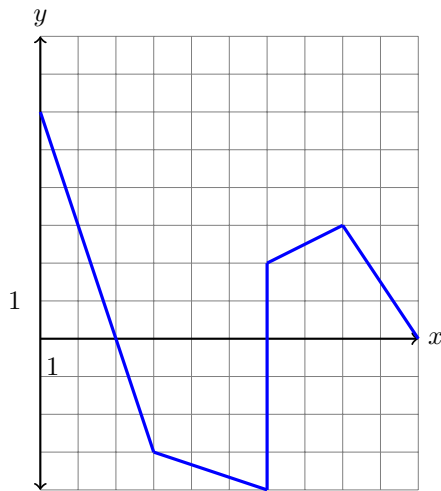
(c) $\int_1^7 \frac{1}{x^3 + 1} dx$

(d) $\int_1^3 2(3x + 1)^2 dx$

2. (2 points) Let $v(t)$ be the velocity of Spongebob walking to the Krusty Krab in feet per minute. If $\int_0^{10} v(t) dt = 1000$, interpret the meaning of this in the context of the problem.

3. (10 points) Phil is a struggling business calculus student and needs some help. The instructor keeps telling him he is wrong, but never seems to tell him why (Bad teacher there)! Below is an example of a problem and Phil's work. Circle where Phil made mistakes, explain to him how he can fix them, and show him how to get the correct answer by redoing the whole problem.

The Problem: The following graph is of $f(x)$. Determine $\int_0^{10} f(x) dx$.



Phil's Work:

$$\int_0^{10} f(x) dx = \int_0^3 f(x) dx + \int_3^6 f(x) dx + \int_6^{10} f(x) dx$$

$$\int_0^3 f(x) dx = (1/2) \cdot 8 \cdot 3 = 12$$

$$\int_3^6 f(x) dx = (1/2) \cdot 3 \cdot (5 + 3) = 12 \text{ but it will be negative since below the } x\text{-axis.}$$

$$\int_6^{10} f(x) dx = (1/2) \cdot 3 \cdot (4 + 2) = 9$$

$$\Rightarrow \int_0^{10} f(x) dx = 12 - 12 + 9 = 9$$