(1 point) Evaluate the definite integral:

$\int_{-3}^{3} 6 - x^2 \, dx =$ 18

(1 point) Evaluate the definite integral

$$\int_{5}^{7} \left(\frac{d}{dt} \sqrt{2 + 5t^4} \right) dt$$

using the Fundamental Theorem of Calculus.

You will need accuracy to at least 4 decimal places for your numerical answer to be accepted. You can also leave your answer as an algebraic expression involving square roots.

$\int_5^7 \left(\frac{d}{dt} \sqrt{2 + 5t^4} \right) dt$

= 53.6568

(1 point) **Note:** You can get full credit for this problem by just answering the last question correctly. The initial questions are meant as hints towards the final answer and also allow you the opportunity to get partial credit.

The integral $\int_{-1}^{3} \left|6x^2 - x^3 - 8x\right| dx$ MUST be evaluated by breaking it up into a sum of three integrals:

$$\int_{-1}^{a} \left|6x^2 - x^3 - 8x\right| dx +$$
$$\int_{a}^{c} \left|6x^2 - x^3 - 8x\right| dx +$$
$$\int_{c}^{3} \left|6x^2 - x^3 - 8x\right| dx$$

where

a = 0

c = 2

$\int_{-1}^{a} \left|6x^2 - x^3 - 8x\right| dx =$ 25/4

$\int_{a}^{c} \left|6x^2 - x^3 - 8x\right| dx =$ 4

$\int_{c}^{3} \left|6x^2 - x^3 - 8x\right| dx =$ 7/4

Thus $\int_{-1}^{3} \left|6x^2 - x^3 - 8x\right| dx =$ 12

(1 point)

Use the Fundamental Theorem of Calculus to evaluate (if it exists)

$$\int_{1}^{2} \frac{4 + u^2}{-9u^3} \, du.$$

If the integral does not exist, type "DNE" as your answer.

-1/6-ln2/9

(1 point)

Evaluate the following limit by first recognizing the sum as a Riemann sum for a function defined on [0, 1]:

$$\lim_{n \to \infty} \sum_{i=1}^{n} \frac{8i^3}{n^4}$$

2

(1 point)

Evaluate the integral

$$\int_{1}^{9} \frac{-5x + 8}{\sqrt{x}} \, dx$$

Integral = -164/3

(1 point)

Consider the integral

$$\int_{0}^{2} \frac{9x - 27}{2x - 3} \, dx$$

If the integral is divergent, type an upper-case "D". Otherwise, evaluate the integral.

D