

HW1 MATH 2502 Spring 2019

§1.1 #6

$$\sum_{i=1}^{100} (3a_i - 4b_i) = 3 \left(\sum_{i=1}^{100} a_i \right) - 4 \left(\sum_{i=1}^{100} b_i \right)$$

$\underbrace{\hspace{10em}}_{=15}$
 $\underbrace{\hspace{10em}}_{=-12}$

\swarrow given

$$= 3(15) - 4(-12)$$

$$= 45 + 48$$

$$= 93$$

#8

$$\sum_{k=1}^{20} (100(k^2 - 5k + 1)) = 100 \left[\sum_{k=1}^{20} k^2 - 5 \left(\sum_{k=1}^{20} k \right) + \sum_{k=1}^{20} 1 \right]$$

"special sums"

$$\rightarrow = 100 \left[\frac{20(21)(41)}{6} - 5 \left(\frac{20(21)}{2} \right) + 20 \right]$$

$$= 184000$$

§1.2 #72

integral = $\frac{1}{2}(\pi(1^2)) - \frac{1}{2}(4 \times 1) + \frac{1}{2}(\pi(3^2))$

$$= \frac{\pi}{2} - 2 + \frac{9\pi}{2}$$

$$= 5\pi - 2$$

#77

$$\int_2^3 3-x \, dx$$

$\int_2^3 3-x \, dx = \text{Area} = \frac{1}{2}(1)(1) = \frac{1}{2}$

#92

$$\int_0^2 3f(x) - 4g(x) \, dx = 3 \int_0^2 f(x) \, dx - 4 \int_0^2 g(x) \, dx$$

$\underbrace{\hspace{10em}}_{= -3}$
 $\underbrace{\hspace{10em}}_{= 2}$

given

$$= 3(-3) - 4(2)$$

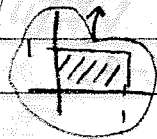
$$= -9 - 8 = -17$$

Problem

Concept: $\int \frac{1}{f(x)} dx = \frac{1}{f(x)}$

$$\#100 \int_0^1 (1-x)^2 dx = \int_0^1 1 - 2x + x^2 dx$$

$$= \int_0^1 1 dx - 2 \int_0^1 x dx + \int_0^1 x^2 dx$$



$$= 1 - 2 \left(\frac{1}{2} \right) + \frac{1}{3}$$

given

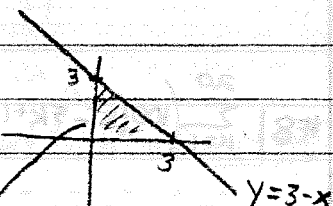
$$= 1 - 2 \left(\frac{1}{2} \right) + \frac{1}{3} = \frac{1}{3}$$

Problem A: #76

$$\text{Avg Val} = \frac{1}{3-0} \int_0^3 3-x dx$$

$$= \frac{1}{2} (3)(3)$$

$$= \frac{1}{3} \cdot \frac{1}{2} \cdot 9 = \frac{9}{6} = \frac{3}{2}$$



#77

$$\text{Avg Val} = \frac{1}{3-2} \int_2^3 3-x dx$$

$$= \frac{1}{2} \text{ from earlier}$$

$$= \frac{1}{2}$$