Professor Fred Katiraie Calculus I Quiz Seven Form A
Name: Solution Summer 2007

$\Delta X = \frac{3 - -2}{5} = 1$

1. Given the function $f(x)=e^{-x^2}$, $-2 \le x \le 3$
Estimate the area under the graph of f(x) using 5 (hint: n = 5)approximating rectangles and taking the sample points to be: (2 Pts Each)

a) left endpoints $=$ sum(seq($(e^{-x^2})*1$, x, −2, 3−1, 1))

$= 1.77239016$

b) midpoints $=$ sum(seq($e^{-x^2}*1$, x, $-2+\frac{1}{2}$, $3-\frac{1}{2}$, 1))

$= 1.770330469$

2. Use the Midpoint Rule with the given value of n to approximate the integral. Round your answer to four decimal places.(2 Pts)

$$\int_1^2 5+\sqrt{2-x^2}\,dx \qquad n=5$$

Note the Domain of this function $5+\sqrt{2-x^2}$ is $-\sqrt{2} \le x \le \sqrt{2}$

So, $\Delta X = \frac{\sqrt{2}-1}{5} \cong 0.0828$

MPS = sum(seq($((5+\sqrt{2-x^2})*0.0828$, x, $1+\frac{0.0828}{2}$, $\sqrt{2}-\frac{0.0828}{2}$, 0.0828))

$\boxed{= 2.387000785}$

$\int_2^8 f(x)dx = 4 \qquad \int_5^8 f(x)dx = 2.5$

3. If $\int_8^2 f(x)dx = -4$ and $\int_5^8 f(x)dx = 2.5$ *and* $\int_2^5 g(x)dx = 8$
Evaluate the following (if possible; otherwise, indicate N/A as your answer) (2 pts each)

a) Find $\int_2^5 f(x)g(x)dx$ Impossible Based ON The Given Information

N/A

b) Find $\int_2^5 [f(x)+1]dx$. $= \int_2^5 f(x)dx + \int_2^5 1\,dx$

$= (4-2.5) + x\Big|_2^5 = 1.5 + 5 - 2 = \boxed{4.5}$

c) Find $\int_2^5 [2f(x)+5g(x)]dx = 2\int_2^5 f(x)dx + 5\int_2^5 g(x)dx$

$= 2(1.5) + 5(8)$

$= 3 + 40 = \boxed{43}$

d) Find $\int_2^5 \frac{f(x)}{g(x)}dx$

N/A

4. If $\int_a^3 4x^2 dx = 27$, find the value of "a". (3 points)

$\frac{4x^3}{3}\Big|_a^3 = 27 \Rightarrow \frac{4}{3}(3^3 - a^3) = 27$

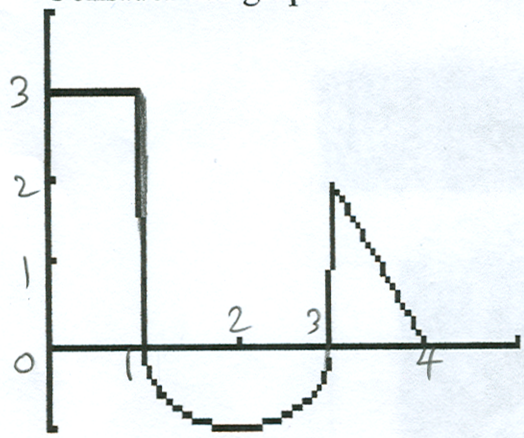
$27 - a^3 = 27\left(\frac{3}{4}\right)$

$27 - a^3 = 20.25$

$-a^3 = -6.75$

$a^3 = 6.75 \Rightarrow a = (6.75)^{\frac{1}{3}}$ $\quad a = 1.89$

5. Consider the graph of the function f(x) and



Using geometry compute the following: (3 Points)

a) $\int_0^1 f(x)\,dx = (1)(3) = \boxed{3}$

b) $\int_1^3 f(x)\,dx = (1)(3) - \frac{1}{2}(\pi)(1)^2 = \boxed{3 - \frac{\pi}{2}}$

c) $\int_0^4 f(x)\,dx = 3 - \frac{\pi}{2} + \frac{1}{2}(1)(2)$

$= \boxed{4 - \frac{\pi}{2}}$