

# Math 104 – Rimmer

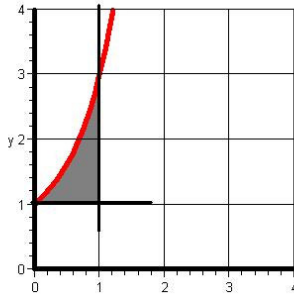
Fall 2008 Practice Exam 1  
Taken from Fall 2007 Exams

Name \_\_\_\_\_

1. Find the area of the region bounded by the curves  $y = x^2 - 4x + 5$  and  $y = 5 - x$ .

- (A)  $\frac{1}{2}$                       (C)  $\frac{3}{4}$                       (E)  $\frac{7}{2}$   
(B)  $\frac{3}{2}$                       (D)  $\frac{5}{2}$                       (F)  $\frac{9}{2}$

2. Find the volume of the solid formed by revolving the region bounded by the graphs of  $y = x^3 + x + 1$ ,  $y = 1$ ,  $x = 1$  about the line  $x = 2$ .



- (A)  $\frac{\pi}{15}$                       (C)  $\frac{29\pi}{15}$                       (E)  $\frac{61\pi}{15}$   
(B)  $\frac{81\pi}{5}$                       (D)  $\frac{891\pi}{5}$                       (F)  $\frac{1070\pi}{5}$

3. The region between the curve  $y = \frac{1}{2\sqrt{x}}$  and the  $x$ -axis from  $x = \frac{1}{4}$  to  $x = 4$  is revolved about the  $x$ -axis to generate a solid. Find the volume of the solid.

- (A)  $\pi$                       (C)  $\frac{\pi}{2}\ln 2$                       (E)  $\frac{\pi}{4}\ln 4$   
(B)  $\ln 4$                       (D)  $\frac{\pi}{4}\ln 2$                       (F)  $\pi \ln 2$

4. Find the average value of the function  $f(x) = \sin(3x)$  on the interval  $[0, \pi]$ .

- (A)  $\frac{2}{3\pi}$                       (C)  $\frac{1}{\pi}$                       (E)  $\frac{5}{2\pi}$   
(B)  $\frac{3}{2\pi}$                       (D)  $\frac{1}{2\pi}$                       (F)  $\frac{5}{3\pi}$

5. Evaluate

$$\int_0^{\pi} \frac{1}{2} x \cos x dx$$

- |      |                   |
|------|-------------------|
| A) 0 | E) -1             |
| B) 1 | F) -2             |
| C) 2 | G) $\frac{1}{2}$  |
| D) 3 | H) $-\frac{1}{2}$ |

6. Evaluate

$$\int_0^1 x \arctan x dx$$

- |                      |                      |
|----------------------|----------------------|
| A) $\frac{\pi}{4}$   | E) $\frac{\pi-2}{2}$ |
| B) $\pi-2$           | F) $\pi-1$           |
| C) $\frac{\pi}{2}$   | G) $\frac{\pi-1}{2}$ |
| D) $\frac{\pi-2}{4}$ | H) $\frac{\pi-1}{4}$ |

7. Evaluate

$$\int_0^{\frac{\pi}{2}} \sin^3 x \cos^2 x dx$$

- |           |              |
|-----------|--------------|
| A) 2 / 15 | E) 2 / 3     |
| B) 4 / 15 | F) 4 / 5     |
| C) 2 / 5  | G) 14 / 5    |
| D) 8 / 15 | H) divergent |

8. Evaluate

$$\int_4^8 \frac{dx}{x^2 - 2x - 3}$$

- A)  $\ln 2$                       E)  $\ln(5/2)$   
B)  $\ln 3$                       F)  $\frac{1}{2}\ln(5/3)$   
C)  $\ln 5$                       G)  $\ln(4/3)$   
D)  $\ln 8$                       H)  $\ln(8/3)$

9. Evaluate

$$\int_0^{1/2} \frac{3x^2 dx}{(1-x^2)^{3/2}}$$

- A) 0                              E)  $\frac{\sqrt{3}}{3} - \frac{\pi}{6}$   
B)  $\frac{\sqrt{3}}{3} - \frac{\pi}{3}$                       F)  $4\sqrt{3} - \frac{4\pi}{3}$   
C)  $\sqrt{3} - \frac{\pi}{2}$                       G)  $3\sqrt{3} - \frac{2\pi}{3}$   
D)  $\sqrt{3} - \pi$                       H)  $3\sqrt{3} - \frac{4\pi}{3}$

10. Evaluate

$$\int_2^{\infty} \frac{dx}{x[\ln(x)]^2}$$

- A)  $\frac{1}{\ln 2}$                       E)  $\frac{2}{e}$   
B) 1                              F)  $\frac{2}{\ln 2}$   
C) 2                              G)  $\ln 2$   
D)  $2\ln 2$                       H) Divergent

## Answers:

- 1. F                      6. D**  
**2. C                      7. A**  
**3. F                      8. F**  
**4. A                      9. C**  
**5. E                      10. A**