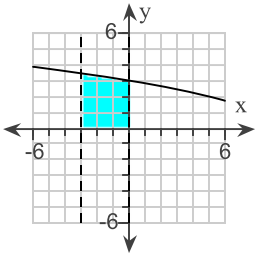
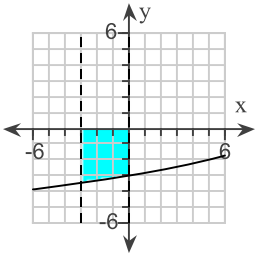
Student: _____	**Instructor:** Lance Burger	**Assignment:** 5.2
Date: _____	**Course:** Fall 2015 Fresno State Math 75 - Burger	
Time: _____	**Book:** California State University, Fresno: Math 75/76/77	

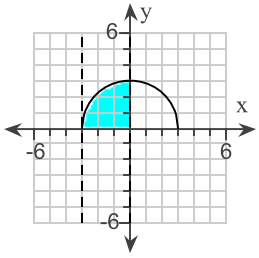
1. Use geometry (not Riemann sums) to evaluate the definite integral. Sketch the graph of the integrand, show the region in question, and interpret your result.

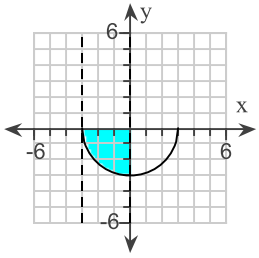
$$\int_{-3}^{0} \sqrt{9-x^2}\,dx$$

Choose the correct graph below.

A. 

B. 

C. 

D. 

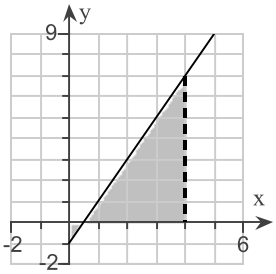
The value of the definite integral $\int_{-3}^{0} \sqrt{9-x^2}\,dx$ as determined by the area under the graph of the integrand is $\square$.

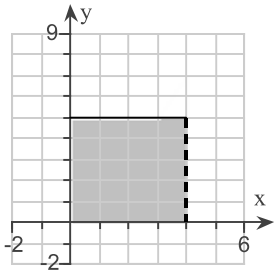
(Simplify your answer. Type an exact answer, using π as needed. Use integers or fractions for any numbers in the expression.)

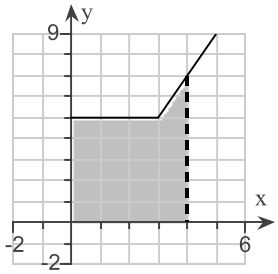
2. Use geometry (not Riemann sums) to evaluate the following definite integral. Sketch a graph of the integrand, show the region in question, and interpret your results.

$$\int_{0}^{4} f(x)\,dx \text{ where } f(x) = \begin{cases} 5 & \text{if } x \le 3 \\ 2x-1 & \text{if } x > 3 \end{cases}$$

Sketch a graph of the integrand, and then shade the region in question. Choose the correct graph below.

A. 

B. 

C. 

$\int_{0}^{4} f(x)\,dx = \square$ (Simplify your answer. Type an integer or a decimal.)

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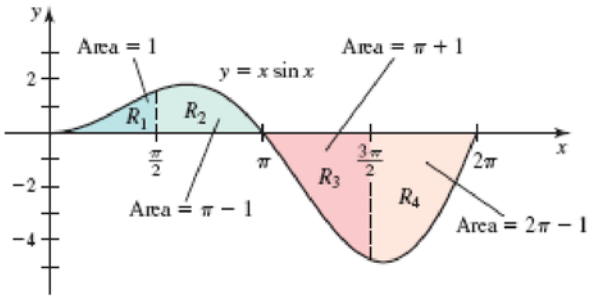
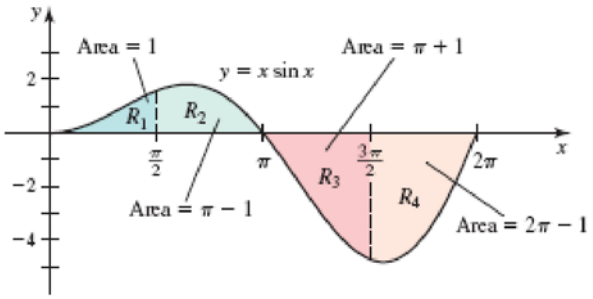
3. The figure to the right shows four regions bounded by the graph of $y = x \sin x$: R_1, R_2, R_3, and R_4, whose areas are 1, $\pi - 1$, $\pi + 1$, and $2\pi - 1$, respectively. Use this information to evaluate the following integral.



$$\int_0^{3\pi/2} x \sin x \, dx$$

$\int_0^{3\pi/2} x \sin x \, dx =$ ☐ (Type an exact answer, using π as needed.)

4. The figure to the right shows four regions bounded by the graph of $y = x \sin x$: R_1, R_2, R_3, and R_4, whose areas are 1, $\pi - 1$, $\pi + 1$, and $2\pi - 1$, respectively. Use this information to evaluate the following integral.



$$\int_0^{\pi} x \sin x \, dx$$

$\int_0^{\pi} x \sin x \, dx =$ ☐ (Type an exact answer, using π as needed.)

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5. Use only the fact that $\int_5^6 6x(8-x)\,dx = 82$ and the definitions and properties of integrals to evaluate the integrals in parts a through d, if possible.

a. Choose the correct answer below and, if necessary, fill in the answer box to complete your choice.

A. $\int_6^5 6x(8-x)\,dx =$ ☐
(Simplify your answer. Type an exact answer, using radicals as needed.)

B. The integral cannot be calculated.

b. Choose the correct answer below and, if necessary, fill in the answer box to complete your choice.

A. $\int_5^6 x(8-x)\,dx =$ ☐
(Simplify your answer. Type an exact answer, using radicals as needed.)

B. The integral cannot be calculated.

c. Choose the correct answer below and, if necessary, fill in the answer box to complete your choice.

A. $\int_6^5 30x(8-x)\,dx =$ ☐
(Simplify your answer. Type an exact answer, using radicals as needed.)

B. The integral cannot be calculated.

d. Choose the correct answer below and, if necessary, fill in the answer box to complete your choice.

A. $\int_5^{12} 6x(8-x)\,dx =$ ☐
(Simplify your answer. Type an exact answer, using radicals as needed.)

B. The integral cannot be calculated.

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6. Suppose $\int_2^4 f(x)\,dx = 3$, $\int_2^7 f(x)\,dx = -3$, and $\int_2^7 g(x)\,dx = -7$. Evaluate the following integrals.

$\int_7^2 g(x)\,dx =$ ☐
(Simplify your answer.)

$\int_2^7 2g(x)\,dx =$ ☐
(Simplify your answer.)

$\int_2^7 [g(x) - f(x)]\,dx =$ ☐
(Simplify your answer.)

$\int_2^7 [4g(x) - f(x)]\,dx =$ ☐
(Simplify your answer.)

7. Use the value of the first integral I to evaluate the two given integrals.

$$I = \int_0^1 (x^3 - 3x)\,dx = -\frac{5}{4}$$

a. $\int_0^1 (6x - 2x^3)\,dx$ **b.** $\int_1^0 (3x - x^3)\,dx$

a. $\int_0^1 (6x - 2x^3)\,dx =$ ☐ (Simplify your answer.)

b. $\int_1^0 (3x - x^3)\,dx =$ ☐ (Simplify your answer.)

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1. C
$\frac{9\pi}{4}$

2. C
21

3. -1

4. π

5. A, -82
A, $\frac{41}{3}$
A, -410
B

6. 7
-14
-4
-25

7. $\frac{5}{2}$
$-\frac{5}{4}$