Student: _____	**Instructor:** Lance Burger	**Assignment:** 5.1
Date: _____	**Course:** Fall 2015 Fresno State Math 75 - Burger	
Time: _____	**Book:** California State University, Fresno: Math 75/76/77	

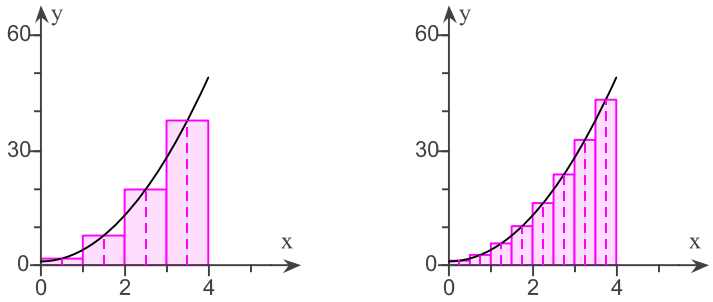
1. The velocity of an object moving along a line is given by $v = 3t^2 + 1$ ft/s on the interval $0 \le t \le 4$.
a. Divide the interval $[0, 4]$ into subintervals, $[0, 1]$, $[1, 2]$, $[2, 3]$, and $[3, 4]$. On each subinterval, assume the object moves at a constant velocity equal to the value of v evaluated at the midpoint of the subinterval and use these approximations to estimate the displacement of the object on $[0, 4]$. (See part (a) of the figure.)
b. Repeat part (a) for $n = 8$ subintervals (see part (b) of the figure).

Click the icon to view the figures.

a. For $n = 4$ subintervals, the approximate displacement of the object is ☐ ft.
(Simplify your answer.)

b. For $n = 8$ subintervals, the approximate displacement of the object is ☐ ft.
(Simplify your answer.)

Figures for (a) and (b)



2. The velocity of an object is given by the following function defined on a specified interval. Approximate the displacement of the object on this interval by subdividing the interval into the indicated number of subintervals. Use the left endpoint of each subinterval to compute the height of the rectangles.

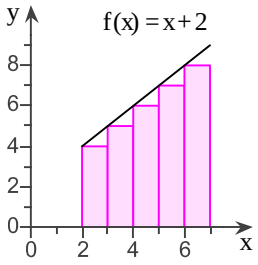
$v = 1/(3t + 3)$ (m/s) for $0 \le t \le 8$; $n = 4$

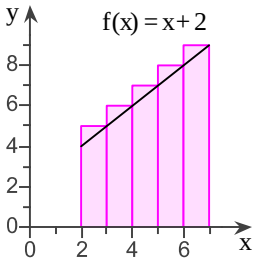
The approximate displacement of the object is ☐ m.
(Round to two decimal places as needed.)

Student: _____ **Date:** _____ **Time:** _____	**Instructor:** Lance Burger **Course:** Fall 2015 Fresno State Math 75 - Burger **Book:** California State University, Fresno: Math 75/76/77	**Assignment:** 5.1

3. Use the figures to calculate the left and right Riemann sums for f on the given interval and the given value of n.

$f(x) = x + 2$ on $[2,7]$; $n = 5$





The left Riemann sum is ☐. (Simplify your answer.)

The right Riemann sum is ☐. (Simplify your answer.)

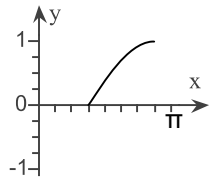
Student: _____	**Instructor:** Lance Burger	**Assignment:** 5.1
Date: _____	**Course:** Fall 2015 Fresno State Math 75 - Burger	
Time: _____	**Book:** California State University, Fresno: Math 75/76/77	

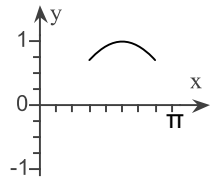
4. Complete the following steps for the given function, interval, and value of n.

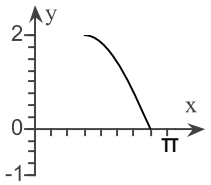
a. Sketch the graph of the function on the given interval.
b. Calculate Δx and the grid points $x_0, x_1, ..., x_n$.
c. Illustrate the left and right Riemann sums, and determine which Riemann sum underestimates and which sum overestimates the area under the curve.
d. Calculate the left and right Riemann sums.

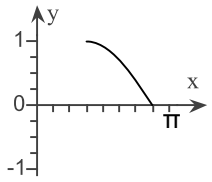
$f(x) = \cos(x - 3\pi/8)$ on $[3\pi/8, 7\pi/8]$; $n = 4$

a. Sketch the graph of $f(x) = \cos(x - 3\pi/8)$ on the interval $\left[\frac{3\pi}{8}, \frac{7\pi}{8}\right]$. Choose the correct graph below.

A. 

B. 

C. 

D. 

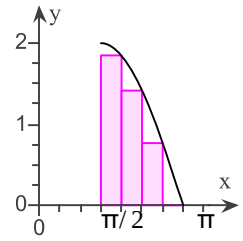
b. $\Delta x =$ ☐ (Type an exact answer, using π as needed.)

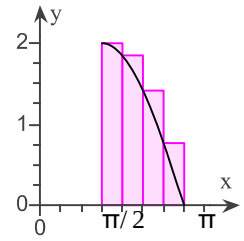
List the grid points.

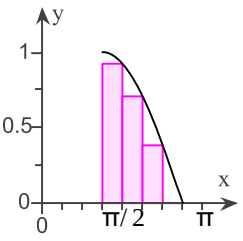
☐

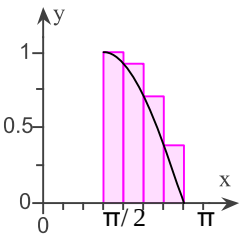
(Use a comma to separate answers as needed. Type exact answers, using π as needed.)

c. Illustrate the left Riemann sum. Choose the correct graph below.

A. 

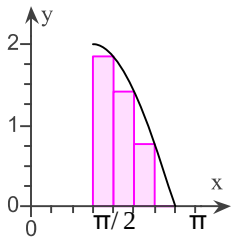
B. 

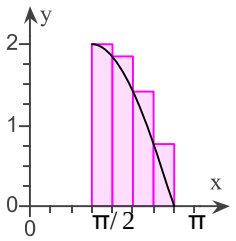
C. 

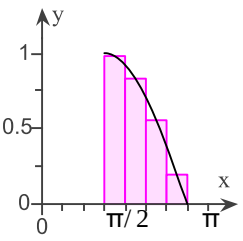
D. 

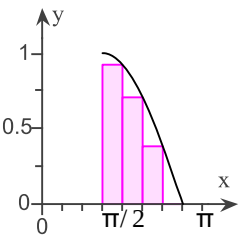
Illustrate the right Riemann sum. Choose the correct graph below.

4. (cont.)

A. 

B. 

C. 

D. 

Which Riemann sum underestimates and which sum overestimates the area under the curve?

A. Both sums overestimate the area.

B. The left Riemann sum underestimates the area and the right Riemann sum overestimates the area.

C. The right Riemann sum underestimates the area and the left Riemann sum overestimates the area.

D. Both sums underestimate the area.

d. The left Riemann sum is ☐. (Round to two decimal places as needed.)

The right Riemann sum is ☐. (Round to two decimal places as needed.)

Student: _____	**Instructor:** Lance Burger	**Assignment:** 5.1
Date: _____	**Course:** Fall 2015 Fresno State Math 75 - Burger	
Time: _____	**Book:** California State University, Fresno: Math 75/76/77	

5. Complete the following steps for the given function, interval, and value of n.

a. Sketch the graph of the function on the given interval.

b. Calculate Δx and the grid points $x_0, x_1, ..., x_n$.

c. Illustrate the left and right Riemann sums, and determine which Riemann sum underestimates and which sum overestimates the area under the curve.

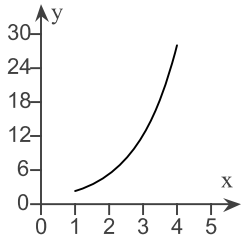
d. Calculate the left and right Riemann sums.

$f(x) = e^{\frac{5x}{6}}$ on $[1,4]$; $n = 6$

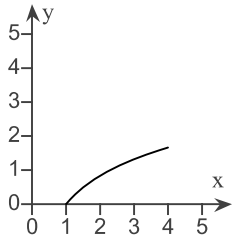
---

a. Sketch the graph of $f(x) = e^{\frac{5x}{6}}$ on the interval $[1,4]$. Choose the correct graph below.

○ A.



○ B.



b. $\Delta x =$ ☐ (Simplify your answer.)

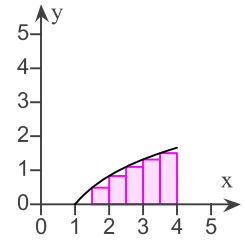
List the grid points.

☐

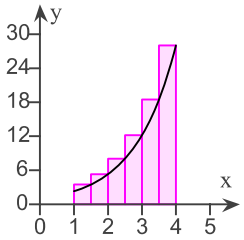
(Simplify your answers. Type integers or decimals. Use a comma to separate answers as needed.)

c. Illustrate the left Riemann sum. Choose the correct graph below.

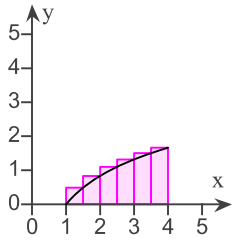
○ A.



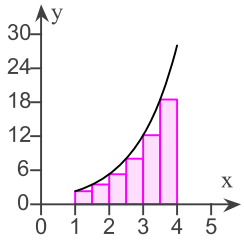
○ B.



○ C.

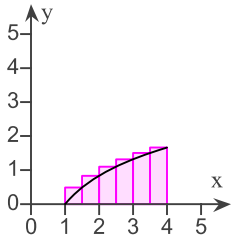


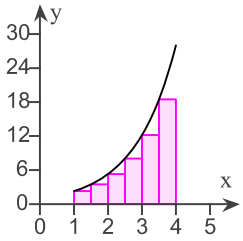
○ D.

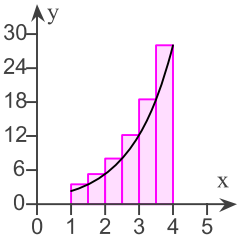


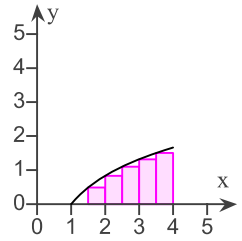
Illustrate the right Riemann sum. Choose the correct graph below.

5. (cont.)

A.


B.


C.


D.


Which Riemann sum underestimates and which sum overestimates the area under the curve?

A. Both sums overestimate the area.

B. The left Riemann sum underestimates the area and the right Riemann sum overestimates the area.

C. The right Riemann sum underestimates the area and the left Riemann sum overestimates the area.

D. Both sums underestimate the area.

d. The left Riemann sum is ☐.
(Round to two decimal places as needed.)

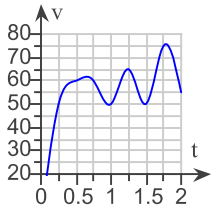
The right Riemann sum is ☐.
(Round to two decimal places as needed.)

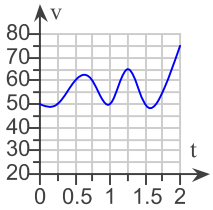
6. The velocities (in mi/hr) of an automobile moving along a straight highway over a 2-hr period are given in the following table.

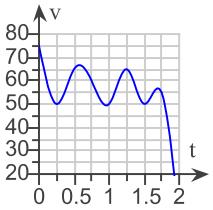
t (hr)	0	0.25	0.5	0.75	1	1.25	1.5	1.75	2
v (mi/hr)	50	50	60	60	50	65	50	55	75

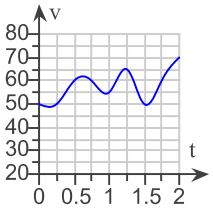
a. Sketch a smooth curve passing through the data points.
b. Find the midpoint Riemann sum approximation to the displacement on [0,2] with n = 2 and n = 4.

a. Choose the correct graph below.

A.


B.


C.


D.


b. The midpoint Riemann sum approximation to the displacement on [0,2] with n = 2 is ☐ miles.
(Type an integer or a decimal.)

The midpoint Riemann sum approximation to the displacement on [0,2] with n = 4 is ☐ miles.
(Type an integer or a decimal.)

7. Express the following sums using sigma notation.

a. $9 + 11 + 13 + 15 + \ldots + 99$
b. $2 + 7 + 12 + \ldots + 42$
c. $7 + 15 + 23 + \ldots + 103$
d. $\frac{1}{1 \cdot 5} + \frac{1}{2 \cdot 6} + \frac{1}{3 \cdot 7} + \ldots + \frac{1}{49 \cdot 53}$

a. $9 + 11 + 13 + 15 + \ldots + 99 = \sum_{k=0}^{45} \square$

b. $2 + 7 + 12 + \ldots + 42 = \sum_{k=0}^{8} \square$

c. $7 + 15 + 23 + \ldots + 103 = \sum_{k=0}^{12} \square$

d. $\frac{1}{1 \cdot 5} + \frac{1}{2 \cdot 6} + \frac{1}{3 \cdot 7} + \ldots + \frac{1}{49 \cdot 53} = \sum_{k=1}^{49} \square$

Student: _____ **Date:** _____ **Time:** _____	**Instructor:** Lance Burger **Course:** Fall 2015 Fresno State Math 75 - Burger **Book:** California State University, Fresno: Math 75/76/77	**Assignment:** 5.1

8. Evaluate the following expressions.

a. $\sum_{k=1}^{17} k$ **b.** $\sum_{k=1}^{6} (2k+3)$ **c.** $\sum_{k=1}^{5} k^2$ **d.** $\sum_{n=1}^{8} (3+n^2)$

e. $\sum_{m=1}^{5} \frac{5m+5}{9}$ **f.** $\sum_{j=1}^{3} 4j-7$ **g.** $\sum_{k=1}^{6} k(5k+9)$ **h.** $\sum_{n=0}^{5} \sin\frac{n\pi}{2}$

a. $\sum_{k=1}^{17} k =$ ☐ (Type an integer or a simplified fraction.)

b. $\sum_{k=1}^{6} (2k+3) =$ ☐ (Type an integer or a simplified fraction.)

c. $\sum_{k=1}^{5} k^2 =$ ☐ (Type an integer or a simplified fraction.)

d. $\sum_{n=1}^{8} (3+n^2) =$ ☐ (Type an integer or a simplified fraction.)

e. $\sum_{m=1}^{5} \frac{5m+5}{9} =$ ☐ (Type an integer or a simplified fraction.)

f. $\sum_{j=1}^{3} 4j-7 =$ ☐ (Type an integer or a simplified fraction.)

g. $\sum_{k=1}^{6} k(5k+9) =$ ☐ (Type an integer or a simplified fraction.)

h. $\sum_{n=0}^{5} \sin\frac{n\pi}{2} =$ ☐ (Type an integer or a simplified fraction.)

Student: _____ **Date:** _____ **Time:** _____	**Instructor:** Lance Burger **Course:** Fall 2015 Fresno State Math 75 - Burger **Book:** California State University, Fresno: Math 75/76/77	**Assignment:** 5.1

1. 67
   67.75

2. 1.12

3. 30
   35

4. D
   $\frac{\pi}{8}$
   $\frac{3\pi}{8}, \frac{\pi}{2}, \frac{5\pi}{8}, \frac{3\pi}{4}, \frac{7\pi}{8}$
   D
   D
   C
   1.18
   0.79

5. A
   0.5
   1,1.5,2,2.5,3,3.5,4
   D
   C
   B
   24.89
   37.75

6. B
   110
   115

7. $2k + 9$
   $5k + 2$
   $8k + 7$
   $\frac{1}{k(k+4)}$

8.

153
60
55
228
100
9
3
644
1