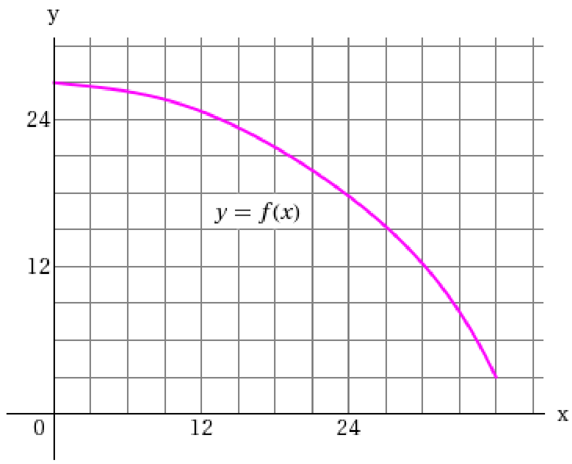
Math 125 HW_1B (8409637)

Due: Wed Jan 13 2016 11:00 PM PST

Question	1	2	3	4	5	6	7	8

1. Question Details SCalcET7 5.1.002. [1535273]

Consider the following.



(a) Use six rectangles to find estimates of each type for the area under the given graph of f from $x = 0$ to $x = 36$.

(i) Sample points are left endpoints.
L_6 = ______

(ii) Sample points are right endpoints.
R_6 = ______

(iii) Sample points are midpoints.
M_6 = ______

(b) Is L_6 an underestimate or overestimate of the true area?

- overestimate
- underestimate

(c) Is R_6 an underestimate or overestimate of the true area?

- overestimate
- underestimate

(d) Which of the numbers gives the best estimate?

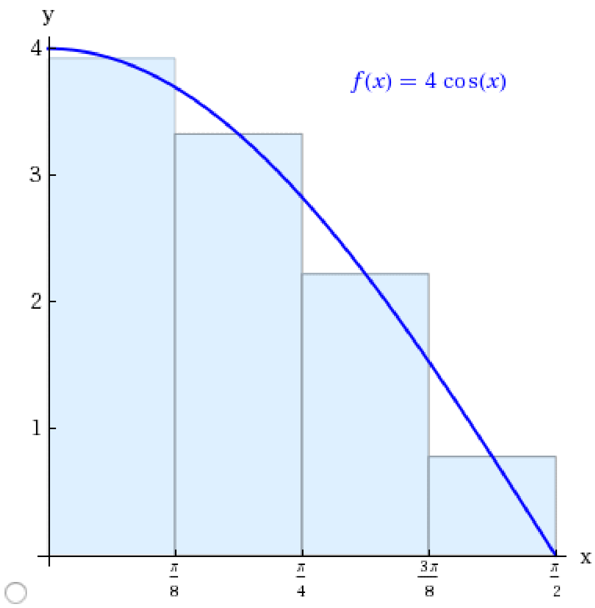
- L_6
- R_6
- M_6

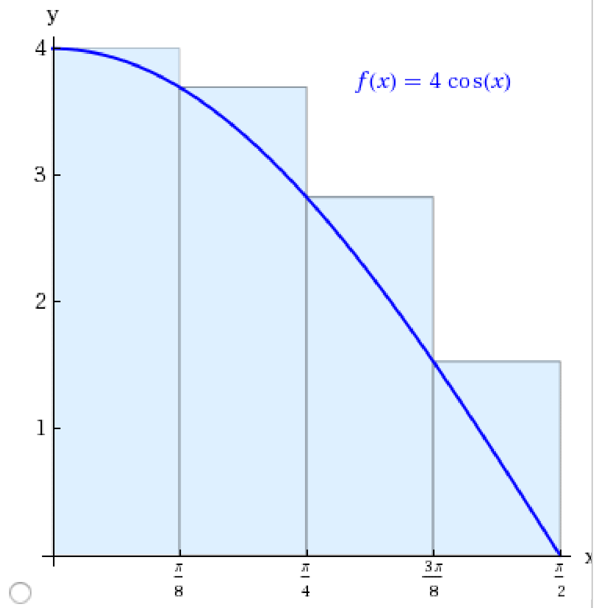
2. Question Details SCalcET7 5.1.003.MI. [1535383]

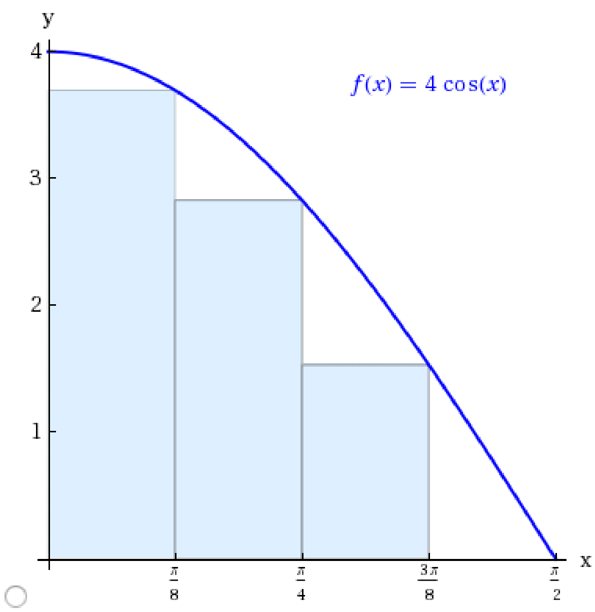
(a) Estimate the area under the graph of $f(x) = 4\cos(x)$ from $x = 0$ to $x = \pi/2$ using four approximating rectangles and right endpoints. (Round your answers to four decimal places.)

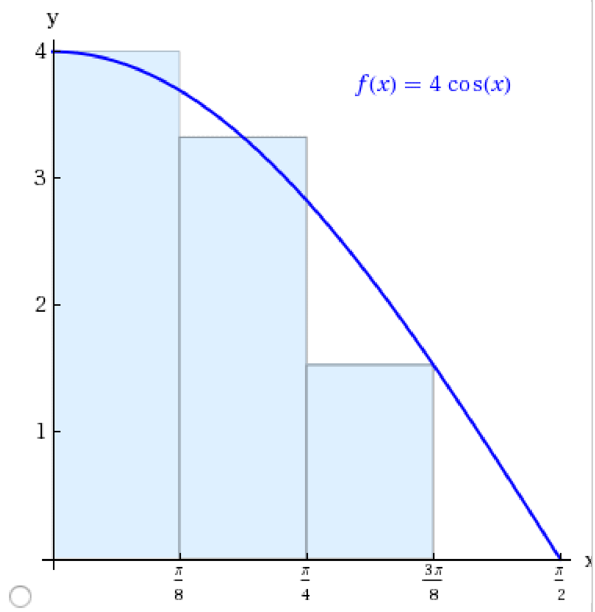
R_4 = [ ]

Sketch the graph and the rectangles.









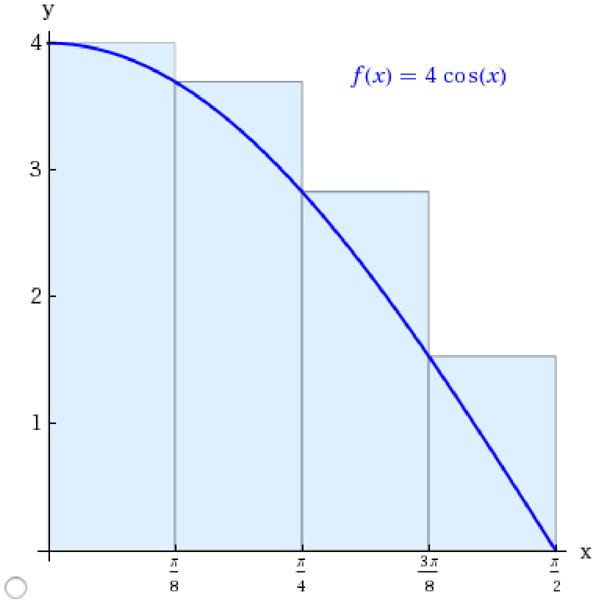
Is your estimate an underestimate or an overestimate?

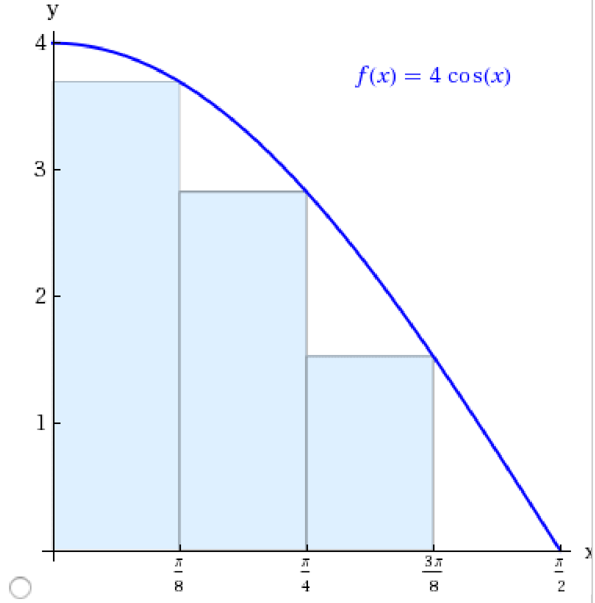
- underestimate
- overestimate

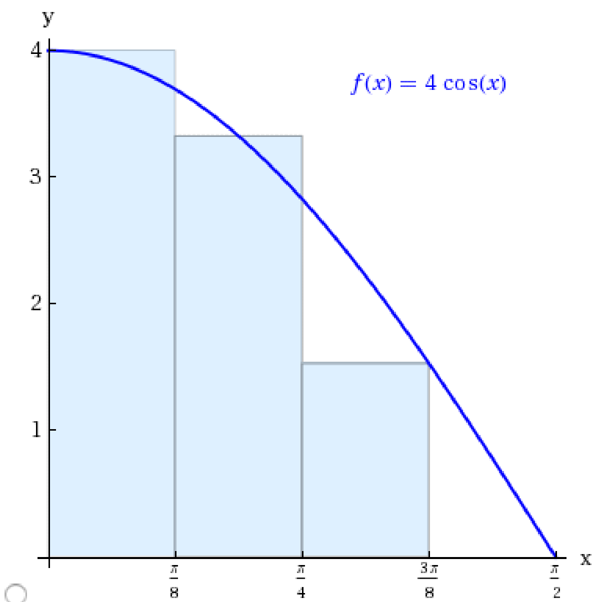
(b) Repeat part (a) using left endpoints.

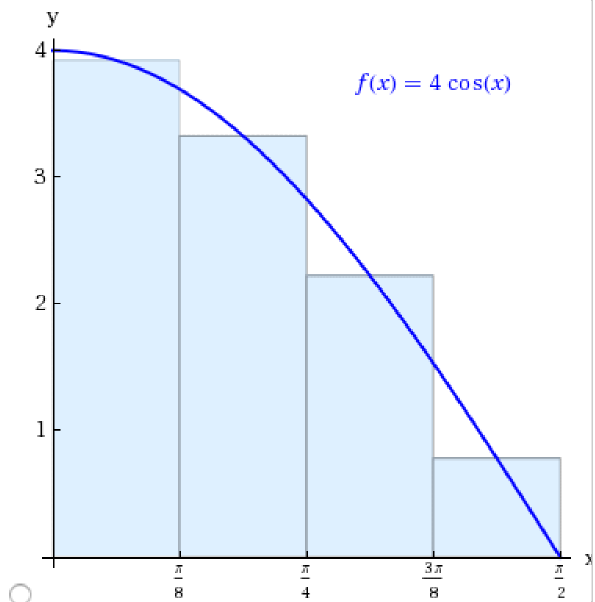
L_4 = [ ]

Sketch the graph and the rectangles.









Is your estimate an underestimate or an overestimate?

- underestimate
- overestimate

3. Question Details SCalcET7 5.1.013.MI. [1835885]

The speed of a runner increased steadily during the first three seconds of a race. Her speed at half-second intervals is given in the table. Find lower and upper estimates for the distance that she traveled during these three seconds.

____ ft (smaller value)

____ ft (larger value)

t (s)	0	0.5	1.0	1.5	2.0	2.5	3.0
v (ft/s)	0	6.7	11.2	15.5	17.5	19.8	20.2

4. Question Details SCalcET7 5.1.016.MI. [1535314]

When we estimate distances from velocity data, it is sometimes necessary to use times $t_0, t_1, t_2, t_3, \ldots$ that are not equally spaced. We can still estimate distances using the time periods $\Delta t_i = t_i - t_{i-1}$. For example, a space shuttle was launched on a mission, the purpose of which was to install a new motor in a satellite. The table provided gives the velocity data for the shuttle between liftoff and the jettisoning of the solid rocket boosters. Use these data to estimate the height, h, above Earth's surface of the space shuttle, 62 seconds after liftoff. (Give the upper approximation available from the data.)

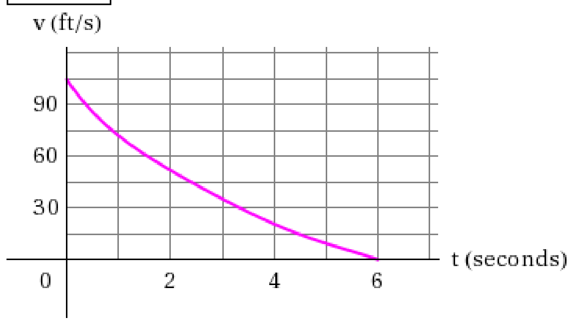
h = ____ ft

Event	Time (s)	Velocity (ft/s)
Launch	0	0
Begin roll maneuver	10	180
End roll maneuver	15	319
Throttle to 89%	20	453
Throttle to 67%	32	742
Throttle to 104%	59	1325
Maximum dynamic pressure	62	1430
Solid rocket booster separation	125	4151

5. Question Details SCalcET7 5.1.017. [1535321]

The velocity graph of a braking car is shown. Use it to estimate the distance traveled by the car while the brakes are applied. (Use M_6 to get the most precise estimate.)

____ ft



6. Question Details SCalcET7 5.1.020. [1795608]

Use the Definition to find an expression for the area under the graph of f as a limit. Do not evaluate the limit.

$$f(x) = x^2 + \sqrt{1 + 2x}, \quad 4 \le x \le 6$$

$$\lim_{n \to \infty} \sum_{i=1}^{n} \underline{\qquad}$$

7. Question Details SCalcET7 5.1.023. [1535300]

Determine a region whose area is equal to the given limit. Do not evaluate the limit.

$$\lim_{n \to \infty} \sum_{i=1}^{n} \frac{\pi}{6n} \tan \frac{i\pi}{6n}$$

- ○ $\tan(x)$ on $\left[0, \frac{\pi}{6}\right]$
- ○ $\tan(x)$ on $[0, 6\pi]$
- ○ $\tan(x)$ on $\left[-\frac{\pi}{6}, \frac{\pi}{6}\right]$
- ○ $x\tan(x)$ on $\left[-\frac{\pi}{6}, \frac{\pi}{6}\right]$
- ○ $x\tan(x)$ on $\left[0, \frac{\pi}{6}\right]$

8. Question Details SCalcET7 5.1.024. [1535370]

(a) Use the following definition to find an expression for the area under the curve $y = x^3$ from 0 to 2 as a limit.

The area A of the region S that lies under the graph of the continuous function f is the limit of the sum of the areas of approximating rectangles:

$$A = \lim_{n \to \infty} R_n = \lim_{n \to \infty} [f(x_1)\Delta x + f(x_2)\Delta x + \ldots + f(x_n)\Delta x]$$

$A =$

- ○ $\lim_{n \to \infty} \sum_{i=2}^{n} \left(\frac{2i}{n}\right) \cdot \frac{2}{n}$
- ○ $\lim_{n \to \infty} \sum_{i=2}^{n} \left(\frac{2i}{n}\right)^3 \cdot \frac{2}{n}$
- ○ $\lim_{n \to \infty} \sum_{i=1}^{n} \left(\frac{2i}{n}\right)^3 \cdot \frac{2i}{n}$
- ○ $\lim_{n \to \infty} \sum_{i=1}^{n} \left(\frac{2i}{n}\right)^3 \cdot \frac{2}{n}$
- ○ $\lim_{n \to \infty} \sum_{i=0}^{n} \left(\frac{2i}{n}\right)^3 \cdot \frac{2i}{n}$

(b) Use the following formula to evaluate the limit in part (a).

$$1^3 + 2^3 + 3^3 + \ldots + n^3 = \left[\frac{n(n+1)}{2}\right]^2$$

[ ]

Assignment Details