Name____Date____________________Class___________

Homework 6.7

1. Using a right Riemann sum over the given intervals, estimate $\int_5^{35} F(t)dt$

8 9 5 8

t	5	13	22	27	35
$F(t)$	44	12	13	17	22

A. 730
B. 661
C. 564
D. 474
E. 325

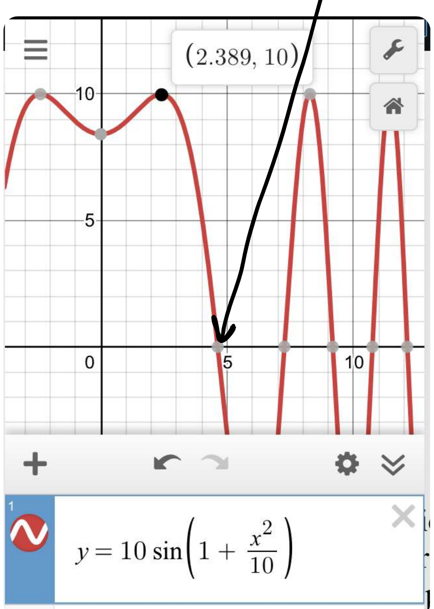
$\int_5^{35} F(t)dt \approx 8(12) + 9(13) + 5(17) + 8(22)$

$\approx 96 + 117 + 85 + 176$

≈ 474

2. For the first six seconds of driving, a car accelerates at a rate of $a(t) = 10\,sin\left(1 + \frac{t^2}{10}\right)$meters per second^2. Which one of the following expressions represents the velocity of the car when it first begins to decelerate?

A. $\int_0^{0.775} a(t)dt$
B. $\int_0^{2.389} a(t)dt$
C. $\int_0^{1.715} a(t)dt$
D. $\int_0^{4.627} a(t)dt$
E. $\int_0^{3.830} a(t)dt$



3. The rate at which gas is flowing through a large pipeline is given in thousands of gallons per month in the chart below.

t (months)	0	3	6	9	12
$R(t)$ (1000 gallons per month)	43	62	56	60	68

Use a midpoint Riemann sum with two equal subintervals to approximate the number of gallons that pass through the pipeline in a year.

A. 594,000
B. 672,000
C. 732,000
D. 744,000
E. 1,068,000

3(62,000) + 9(60,000

732,000

4. Let f be a continuous function on the closed interval [1, 11]. If the values of f are given below at three points, use a trapezoidal approximation to find $\int_1^{11} f(x)dx$ using two subintervals.

x	1	9	11
$f(x)$	23	14	10

A. 165
B. 172
C. 190.5
D. 40
E. 80

$A \approx \frac{1}{2}(8)(23+14) + \frac{1}{2}(2)(14+10)$

$\approx 4(37) + (24)$

$\approx 148 + 24$

5. If $\int_a^b f(x)dx = 2a - 3b$, then $\int_a^b [f(x) + 3]dx =$

A. $2a - 3b + 3$
B. $3b - 3a$
C. $-a$
D. $5a - 6b$
E. $a - 6b$

$$\int_a^b f(x)dx + \int_a^b 3\,dx$$

$$= 2a - 3b + 3x\Big|_a^b$$

$$= 2a - 3b + 3b - 3a$$

$$= -a$$

Use the table below to answer questions 6 and 7. Suppose the function $f(x)$ is a continuous function and f is the derivative of $F(x)$.

x	0	1	2	3
$f(x)$	–1	0	1	–2
$F(x)$	4	3	A	8

6. What is $\int_1^3 f(x)dx$? $= F(3) - F(1)$

$= 8 - 3$

$= 5$

A. 5
B. 8
C. 4
D. 19
E. Cannot be determined

7. If the area under the curve of $f(x)$ on the interval $0 \le x \le 2$ is equal to the area under the curve $f(x)$ on the interval $2 \le x \le 3$, then what is the value of A?

A. 4
B. 2
C. 5.5
D. 6
E. Cannot be determined

$$\int_0^2 f(x)dx = \int_2^3 f(x)dx$$

$$F(2) - F(0) = F(3) - F(2)$$

$$A - 4 = 8 - A$$

$$2A = 12$$

$$A = 6$$