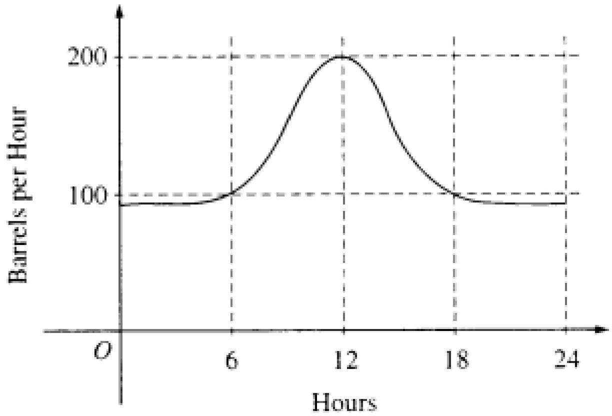
Chap4 Practice Test

Name

1.



The flow of oil, in barrels per hour, through a pipeline on July 9 is given by the graph shown above. Of the following, which best approximates the total number of barrels of oil that passed through the pipeline that day?

(A) 500

(B) 600

(C) 2,400

(D) 3,000

(E) 4,800

2.

x	2	3	5	8	13
$f(x)$	6	–2	–1	3	9

The function f is continuous on the closed interval [2,13] and has values as shown in the table above. Using the intervals [2,3], [3,5], [5,8], and[8,13] what is the approximation of $\int_{2}^{13} f(x)\, dx$ obtained from a left Riemann sum?

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(A) 6

(B) 14

(C) 28

(D) 32

(E) 50

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3. The closed interval [*a*,*b*] is partitioned into *n* equal sub intervals, each of widthΔx , by the numbers $x_0, x_1, \cdots, x_n$ where $a = x_0 < x_1 < x_2 < \cdots < x_{n-1} < x_n = b$. What is $\lim_{n\to\infty} \sum_{i=1}^{n} \sqrt{x_i}\,\Delta x$?

(A) $\frac{2}{3}(b^{\frac{3}{2}} - a^{\frac{3}{2}})$

(B) $b^{\frac{3}{2}} - a^{\frac{3}{2}}$

(C) $\frac{3}{2}(b^{\frac{3}{2}} - a^{\frac{3}{2}})$

(D) $b^{\frac{1}{2}} - a^{\frac{1}{2}}$

(E) $2(b^{\frac{1}{2}} - a^{\frac{1}{2}})$

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4. $\frac{d}{dx}\left(\int_0^{x^3} \ln\ (t^2+1)\ dt\right) =$

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(A) $\frac{2x^3}{x^6+1}$

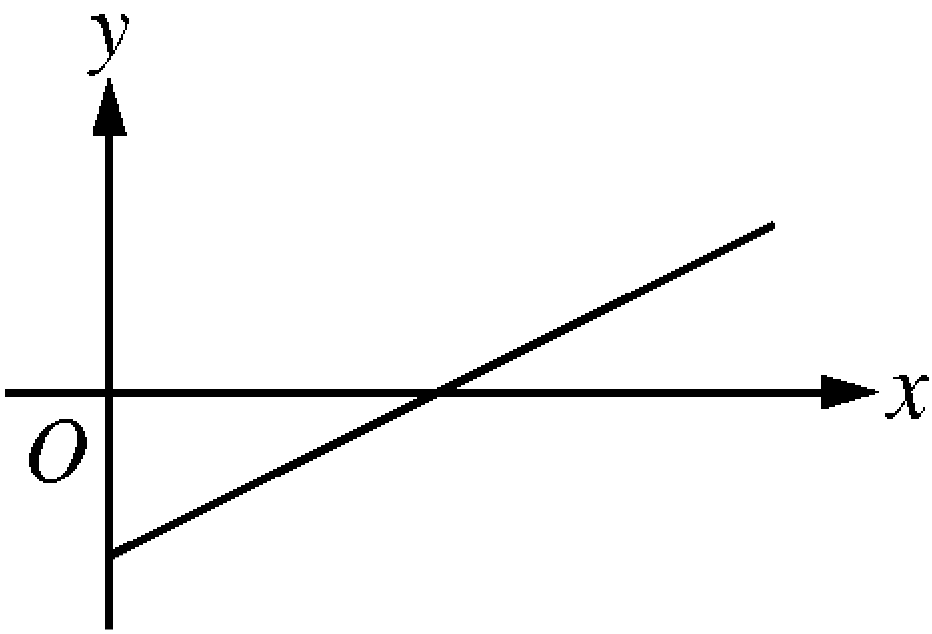
(B) $\frac{3x^2}{x^6+1}$

(C) $\ln\ \left(x^6+1\right)$

(D) $2x^3\ \ln\ \left(x^6+1\right)$

(E) $3x^2\ \ln\ \left(x^6+1\right)$

5.



Graph of f

The figure above shows the graph of *f*. If $f\ (x)=\int_2^x g\ (t)\ \ dt$, which of the following could be the graph of $y=g\ (x)$?

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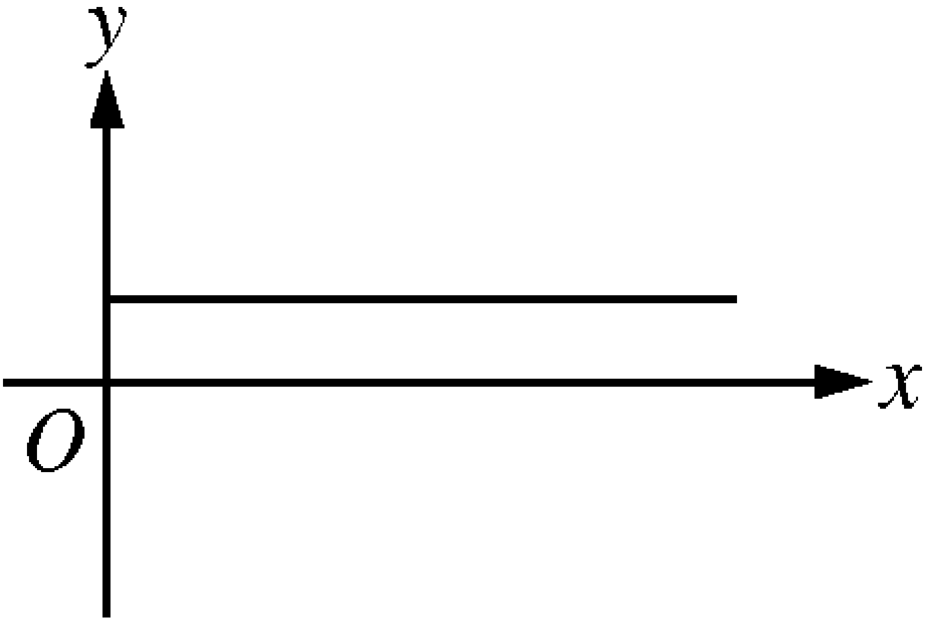
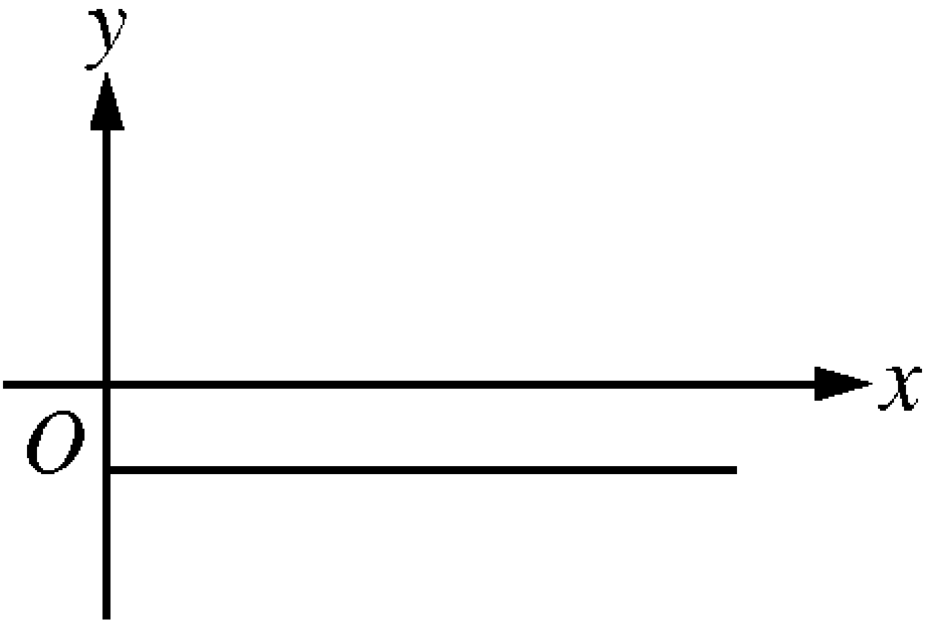
(A)



(B)



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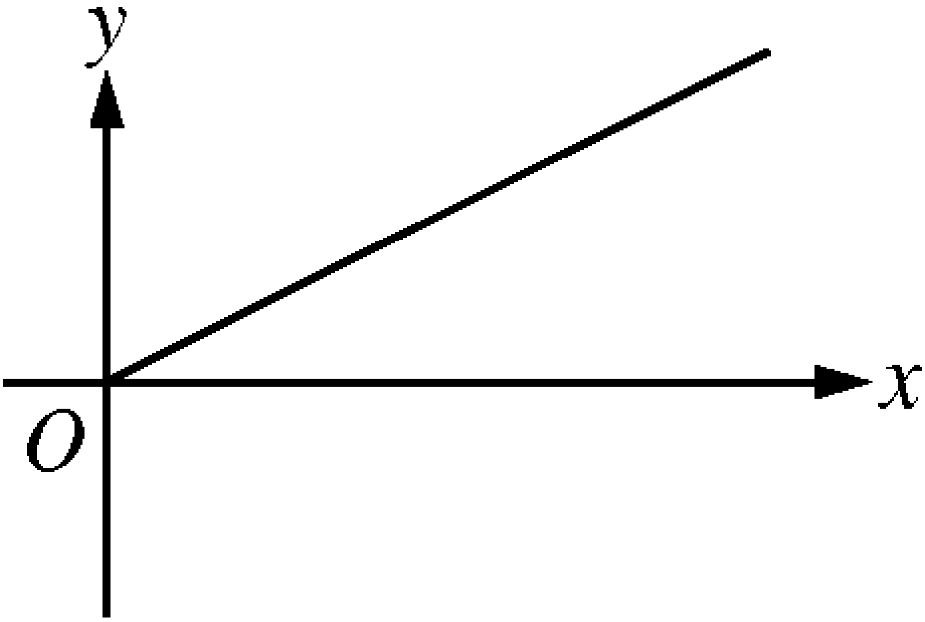
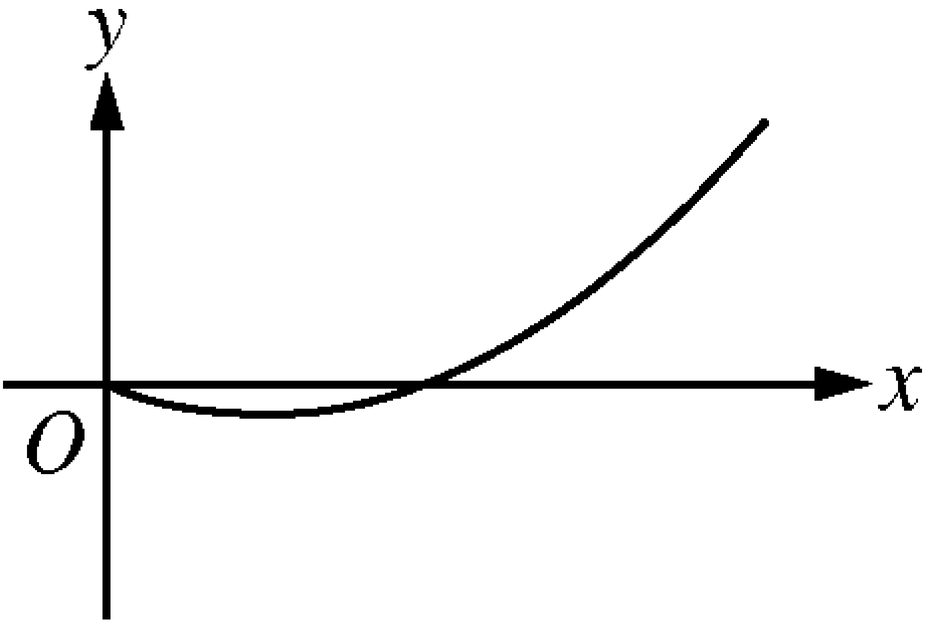
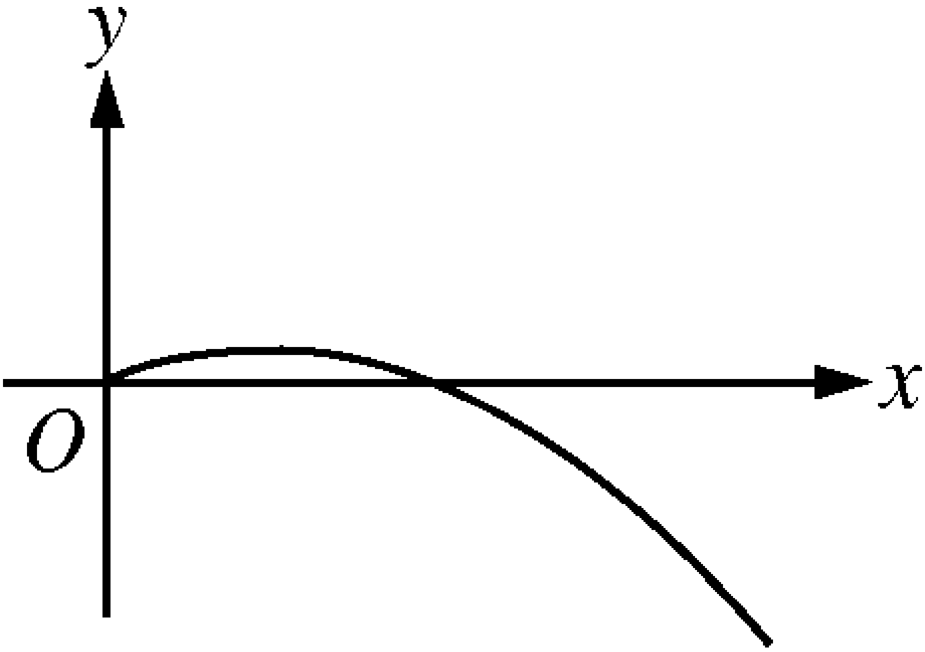

y
x
O

Ⓓ


y
x
O

(E) 

6. If $\int_1^{10} f(x)dx = 4$ and $\int_{10}^{3} f(x)dx = 7$, then $\int_1^{3} f(x)dx =$

(A) −3

(B) 0

(C) 3

(D) 10

(E) 11

7. $\int_0^{\frac{\pi}{2}} \frac{\cos\theta}{\sqrt{1+\sin\theta}} d\theta =$

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(A) $-2(\sqrt{2}-1)$

(B) $-2\sqrt{2}$

(C) $2\sqrt{2}$

(D) $2(\sqrt{2}-1)$

(E) $2(\sqrt{2}+1)$

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8. $\int \frac{1}{x^2}\, dx =$

(A) $\ln x^2 + C$

(B) $-\ln x^2 + C$

(C) $x^{-1} + C$

(D) $-x^{-1} + C$

(E) $-2x^{-3} + C$

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9. $\int (3x+1)^5 dx =$

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(A) $\frac{(3x+1)^6}{18}+C$

(B) $\frac{(3x+1)^6}{6}+C$

(C) $\frac{(3x+1)^6}{2}+C$

(D) $\frac{\left(\frac{3x^2}{2}+x\right)^6}{2}+C$

(E) $\left(\frac{3x^2}{2}+x\right)^5+C$

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10. $\int_1^e \frac{x^2+1}{x}\,dx =$

(A) $\frac{e^2-1}{2}$

(B) $\frac{e^2+1}{2}$

(C) $\frac{e^2+2}{2}$

(D) $\frac{e^2-1}{e^2}$

(E) $\frac{2e^2-8e+6}{3e}$

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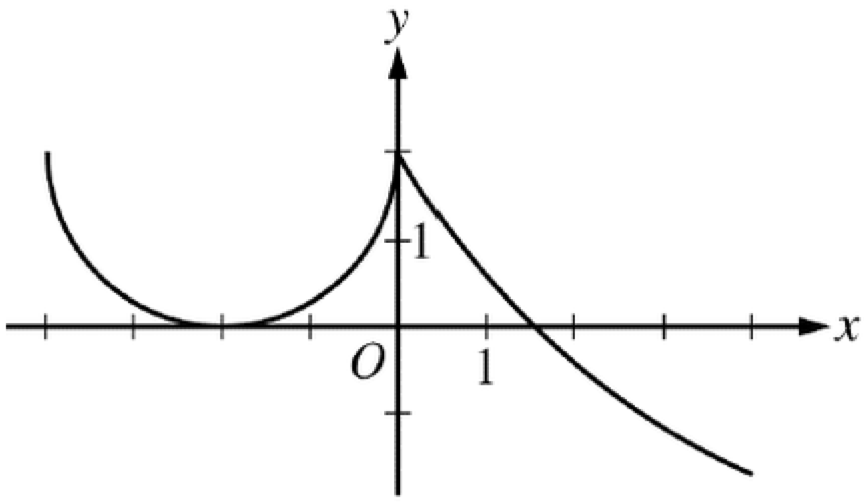

Graph of f'

The derivative of a function *f* is defined by $f'(x) = \begin{cases} g(x) & \text{for } -4 \leq x \leq 0 \\ 5e^{-x/3} - 3 & \text{for } 0 < x \leq 4 \end{cases}$.

The graph of the continuous function , *f*′ shown in the figure above, has x-intercepts at *x* = −2 and x = 3 ln (5/3). The graph of *g* on -4 ≤ x ≤ 0 is a semicircle, and *f*(0) = 5.

11. Find *f*(-4) and *f*(4).

Please respond on separate paper, following directions from your teacher.

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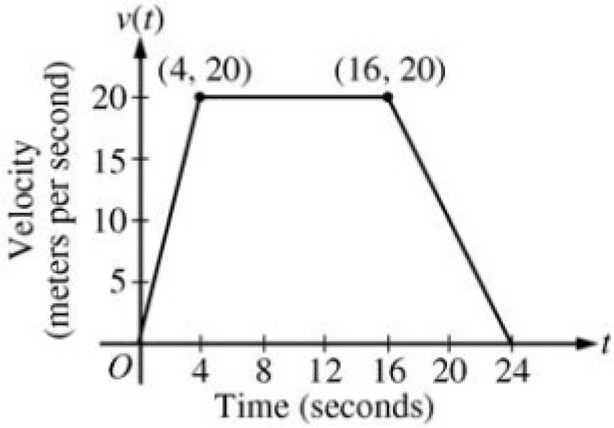

A car is traveling on a straight road. For $0 \leq t \leq 24$ seconds, the car's velocity *v(t)*, in meters per second, is modeled by the piecewise-linear function defined by the graph above.

12. Find $\int_0^{24} v(t)\,dt$. Using correct units, explain the meaning of $\int_0^{24} v(t)\,dt$.

Please respond on separate paper, following directions from your teacher.

x	−1.5	−1.0	−0.5	0	0.5	1.0	1.5
$f(x)$	−1	−4	−6	−7	−6	−4	−1
$f'(x)$	−7	−5	−3	0	3	5	7

Let *f* be a function that is differentiable for all real numbers. The table above gives the values of *f* and its derivative *f'* for selected points *x* in the closed interval $-1.5 \leq x \leq 1.5$. The second derivative of f has the property that *f''(x)* > 0 for $-1.5 \leq x \leq 1.5$.

13. Evaluate $\int_0^{1.5} (3f'(x) + 4)\,dx$. Show the work that leads to your answer.

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Please respond on separate paper, following directions from your teacher.