

6.6 Properties of Definite Integrals

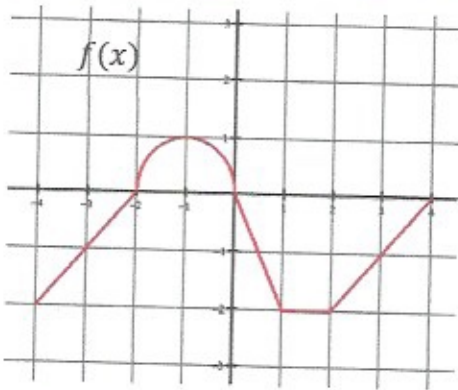
Calculus

Name: _____

CA #1

The graph of f consists of line segments and a semicircle. Evaluate each definite integral.

1.



a. $\int_{-4}^{-2} f(x) dx =$

d. $\int_{-4}^4 f(x) dx =$

b. $\int_{-2}^0 4f(x) dx =$

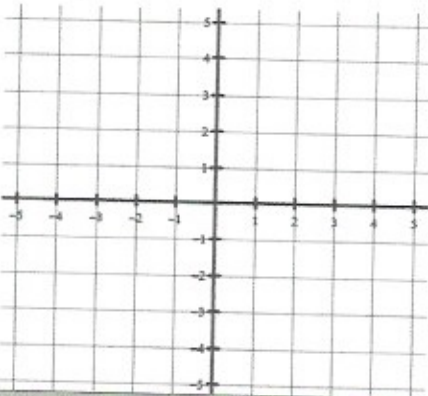
e. $\int_4^2 f(x) dx =$

c. $\int_4^0 f(x) dx =$

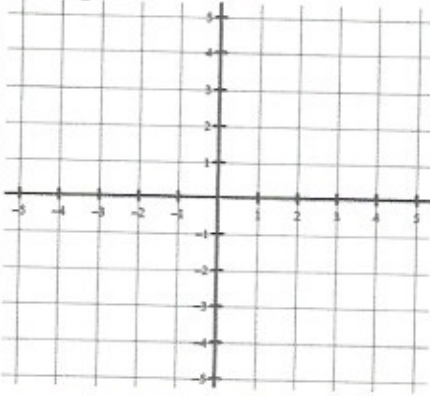
f. $\int_{-1}^1 f(x) dx =$

Sketch a graph of the definite integral. Evaluate the integral with a graphing calculator.

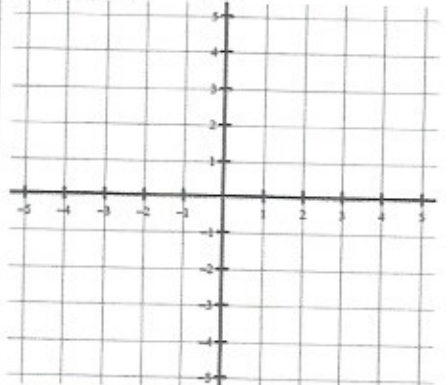
2. $\int_{-1}^0 (x^3 - 1) dx =$



3. $\int_{-1}^2 (5 - x^2) dx =$



4. $\int_{-2}^3 -|x + 1| dx =$



Let f be a continuous functions that produces the following definite integral values.

$$\int_{-4}^6 f(x) dx = 2 \text{ and } \int_6^8 f(x) dx = -5$$

Find the following.

5. $\int_{-4}^6 5f(x) dx =$

6. $\int_{-4}^8 f(x) dx =$

7. $\int_8^6 f(x) dx =$

Let f be a continuous functions that produces the following definite integral values.

$$\int_0^3 f(x) dx = -4 \text{ and } \int_3^7 f(x) dx = 2$$

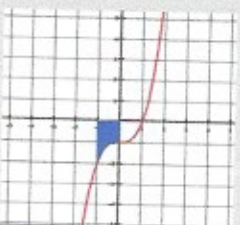
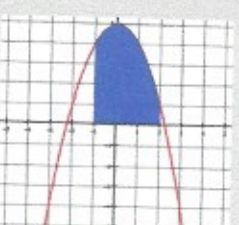

Find the following.

8. $\int_3^0 f(x) dx =$

9. $\int_3^3 f(x) dx =$

10. $\int_3^7 6f(x) dx =$

Answers to 6.6 CA #1

<p>1. a. -2 b. 2π c. 5 d. $\frac{\pi}{2} - 7$ e. 2 f. $\frac{\pi}{4} - 1$</p>	<p>2. -1.25</p> 	<p>3. 12</p> 	<p>4. -8.5</p> 	<p>5. 10 6. -3 7. 5 8. 4 9. 0 10. 12</p>
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6.7 Definite Integrals

Calculus

Name: _____

CA #1

Find the value of the definite integral.

1. $\int_0^4 (4x + 5) dx$

2. $\int_{-1}^2 \left(3x^2 - \frac{4}{x^2} + 1 \right) dx$

3. $\int_4^{16} -\sqrt{x} dx$

4. $\int_{-\pi}^{\frac{\pi}{2}} (1 - \cos x) dx$

5. $\int_0^{\pi} (3 - \sin x) dx$

Use the given information to find the value of the function.

6. If $g'(x) = \cos x$ and $g(\pi) = 7$, then $g\left(\frac{3\pi}{2}\right) =$

7. Let $h(x)$ be an antiderivative of $x^2 - 2x$. If $h(-3) = 4$, then $h(1) =$

8. Let f be a differentiable function such that $f(2) = 6$ and $f'(x) = 3x^2 - x$. What is the value of $f(3)$?

1. 52	2. 18	3. $-\frac{3}{112}$	4. $\frac{2}{\pi} + 1$	5. $3\pi - 2$	6. 6	7. $21\frac{3}{4} = \frac{69}{4}$	8. 22.5
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Answers to 6.7 CA #1

6.8 Indefinite Integrals

Calculus

Name: _____

CA #1

Find the following indefinite integrals.

1. $\int \left(2x^2 - \frac{3}{x} + 2^x \right) dx$

2. $\int \left(\frac{x^7 - 2x}{x^2} \right) dx$

3. $\int \sqrt{x}(x - \sqrt[4]{x}) dx$

4. $\int \left(\frac{8x^2 + 2x - 3}{x} \right) dx$

5. $\int \left(\frac{1}{x} - e^x \right) dx$

6. $\int \frac{1}{x\sqrt{x}} dx$

Find the function that satisfies the given conditions.

7. $s'(t) = 8t^2 + 6t - 1$ and $s(3) = 50$

8. $\frac{dy}{dx} = 2e^x + \sin x$ and $y(0) = 2$

9. $f'''(x) = 3x^2 - 8x$ and $f'(-2) = -20$ and $f(1) = 3$

1. $\frac{5}{2}x^3 - 3\ln x + \frac{\ln 2}{2} + C$	2. $\frac{6}{1}x^6 - 2\ln x + C$	3. $\frac{5}{2}x^{\frac{5}{2}} - \frac{7}{4}x^{\frac{1}{2}} + C$
4. $4x^2 + 2x - 3\ln x + C$	5. $\ln x - e^x + C$	6. $-\frac{x^2}{2}$
7. $s(t) = \frac{8}{3}t^3 + 3t^2 - t - 46$	8. $2e^x - \cos x + 1$	9. $f(x) = \frac{1}{12}x^3 - \frac{4}{3}x^2 + 4x + \frac{13}{12}$

Answers to 6.8 CA #1

6.9 Integrating Using Substitution

Calculus

Name: _____

CA #1

Find the indefinite integrals.

1. $\int x(x^2 + 3)^5 dx$

2. $\int \sin(x)\cos^3(x) dx$

3. $\int \frac{2x-1}{x^2-x+5} dx$

4. $\int \cos x \sqrt{\sin x} dx$

5. $\int \frac{x^3}{(5x^6+2)^3} dx$

Evaluate the definite integrals.

6. $\int_0^1 x(x^2 + 1)^3 dx$

7. $\int_0^2 3x^2 \sqrt{x^3 + 1} dx$

8. $\int_1^2 e^{1-x} dx$

$$9. \int_1^e \frac{(1+\ln x)^2}{x} dx$$

$$10. \int_0^{\frac{\pi}{8}} \tan(2x)\sec^2(2x) dx$$

Answers to 6.9 CA #1

1. $\frac{1}{12}(x^2 + 3)^6 + C$	2. $-\frac{1}{4}\cos^4 x + C$	3. $\ln x^2 - x + 5 + C$	4. $\frac{2}{3}(\sin x)^{\frac{3}{2}} + C$		
5. $\frac{-1}{40(5x^4+2)^2} + C$	6. $\frac{15}{8}$	7. $\frac{52}{3}$	8. $1 - \frac{1}{e}$	9. $\frac{7}{3}$	10. $\frac{1}{4}$

6.10 Integrating with Long Division and Completing the Square

Calculus

Name: _____

CA #1

Find the indefinite integral.

1. $\int \frac{6x^2}{x+1} dx$

2. $\int \frac{1}{x^2+6x+10} dx$

3. $\int \frac{5x^2-31x-20}{5x+4} dx$

4. $\int \frac{20x^3-4x^2-67x+44}{10x-7} dx$

$$5. \int \frac{1}{x^2 - 12x + 36} dx$$

$$6. \int \frac{1}{\sqrt{-x^2 - 4x - 3}} dx$$

Answers to 6.10 CA #1

1. $3x^2 - 6x + 6 \ln x + 1 + C$	2. $\tan^{-1}(x + 3) + C$	3. $\frac{1}{2}x^2 - 7x + \frac{8}{5} \ln 5x + 4 + C$
4. $\frac{2}{3}x^3 + \frac{1}{2}x^2 - 6x + \frac{1}{5} \ln 10x - 7 + C$	5. $-\frac{1}{(x-6)} + C$	6. $\sin^{-1}(x + 2) + C$