Name_____

Please print your name as it appears on the class roster.

To receive full credit on each problem, you must write all steps to arrive at your answer. Please explain how you got your answers.

Evaluate the definite integral.

1) $\int_{-1}^{0} (4x^2 + 6x + 3)^2(4x + 3)\, dx$

2) $\int_{\pi/3}^{2\pi} 3\cos^2 x \sin x\, dx$

Find an approximate value for the integral, using the trapezoidal rule with n intervals. Round the answer to the nearest tenth if necessary.

3) $\int_{1}^{3} (2x + 5)\, dx, \quad n = 4$

4) $\int_{0}^{2} 9x^2\, dx, \quad n = 2$

Perform the integration.

5) $\int_{0}^{1} \frac{4x\, dx}{\sqrt{4 + 2x^2}}$

6) $\int e^{\cot v} \csc^2 v\, dv$

7) $\int \frac{4^{\ln x}}{x}\, dx$

8) $\int \frac{9^{\ln x}}{x}\, dx$

9) $\int \frac{dx}{1 + (7x + 6)^2}$

10) $\int \sin 2x \sec x \, dx$

Use integration by parts to evaluate the integral.

11) $\int x^4 \ln 8x \, dx$

12) $\int (2x - 1) \ln(6x) \, dx$

13) $\int (x^2 - 6x) e^x \, dx$

Apply integration by parts more than once to evaluate the integral.

14) $\int e^{2x} x^2 \, dx$

Perform the integration.

15) $\int \sin 5x \cos 2x \, dx$

16) $\int 2 \csc^3 x \cot x \, dx$

17) $\int_0^{\pi/3} \tan x \sec^4 x \, dx$

18) $\int \frac{dx}{(x^2 + 81)^{3/2}}$

19) $\int \sqrt{49 - x^2} \, dx$

20) $\int \frac{x^3}{\sqrt{x^2 + 3}} dx$

21) $\int x\sqrt{x+7}\,dx$

Use the method of partial decomposition to perform the required integration.

22) $\int \frac{5x+43}{x^2+10x+21}\,dx$

23) $\int \frac{5x-7}{x^2-4x-5}dx$

24) $\int \frac{9x+20}{x^3+4x^2+4x}\,dx$

Evaluate the integral.

25) $\int \frac{dx}{x\,(\ln x)^6}$

26) $\int \frac{dx}{x^2+4x+8}$

Use a table of integrals, perhaps with a substitution, to evaluate the given integral.

27) $\int \frac{dx}{x^2\sqrt{2x-7}}$

Evaluate the improper integral or state that it diverges.

28) $\int_6^{\infty} \frac{dx}{x^2-25}$

29) $\int_{-\infty}^{\infty} \frac{13x}{(x^2-1)^2}\,dx$

30) $\int_{-\infty}^{-2} \frac{3}{x^5}\,dx$

Use a finite approximation to estimate the area under the graph of the given function on the stated interval as instructed.

31) $f(x) = \frac{1}{x}$ between $x = 3$ and $x = 8$ using the midpoint sum with two rectangles of equal width.

32) $f(x) = x^2$ between $x = 1$ and $x = 5$ using the midpoint sum with four rectangles of equal width.

Evaluate the integral.

33) $\int 8 \cos^3 5x \, dx$

34) $\int_0^{\pi/2} \cos 7t \cos 6t \, dt$

Express the integrand as a sum of partial fractions and evaluate the integral.

35) $\int \frac{10x + 36}{x^3 + 6x^2 + 9x} \, dx$

Evaluate the integral.

36) $\int \frac{2x^2}{\sqrt{25 - x^2}} \, dx$

Use the Trapezoidal Rule with n = 4 steps to estimate the integral.

37) $\int_{-1}^{1} (x^2 + 3) \, dx$

Evaluate the improper integral or state that it is divergent.

38) $\int_0^{\infty} 15e^{-15x} \, dx$

1) $\frac{13}{3}$

Objective: (5.4) Evaluate Definite Integral Using Substitution

2) $-\frac{7}{8}$

Objective: (5.4) Evaluate Definite Integral Using Substitution

3) 18

Objective: (5.6) Use Trapezoidal Rule to Approximate Integral

4) 27

Objective: (5.6) Use Trapezoidal Rule to Approximate Integral

5) $2\sqrt{6} - 4$

Objective: (7.1) Evaluate Integral By Substitution I

6) $-e^{\cot v} + C$

Objective: (7.1) Evaluate Integral By Substitution III

7) $\frac{4^{\ln x}}{\ln 4} + C$

Objective: (7.1) Evaluate Integral By Substitution III

8) $\frac{9^{\ln x}}{\ln 9} + C$

Objective: (7.1) Evaluate Integral By Substitution III

9) $\frac{1}{7}\tan^{-1}(7x + 6) + C$

Objective: (7.1) Evaluate Integral By Trigonometric Substitution

10) $-2\cos x + C$

Objective: (7.1) Evaluate Integral Using Trig Identities

11) $\frac{1}{5}x^5 \ln 8x - \frac{1}{25}x^5 + C$

Objective: (7.2) Evaluate Integral Using Integration by Parts II

12) $(x^2 - x)\ln 6x - \frac{x^2}{2} + x + C$

Objective: (7.2) Evaluate Integral Using Integration by Parts II

13) $e^x[x^2 - 8x + 8] + C$

Objective: (7.2) Evaluate Integral Using Integration by Parts II

14) $\frac{1}{2}x^2e^{2x} - \frac{1}{2}xe^{2x} + \frac{1}{4}e^{2x} + C$

Objective: (7.2) Evaluate Integral Using Integration by Parts Multiple Times

15) $-\frac{1}{14}\cos 7x - \frac{1}{6}\cos 3x + C$

Objective: (7.3) Evaluate Integral (Sine and Cosine)

16) $-\frac{2}{3}\csc^3 x + C$

Objective: (7.3) Evaluate Integral (Tangent/Secant/Cotangent)

17) $\frac{15}{4}$

Objective: (7.3) Evaluate Integral (Tangent/Secant/Cotangent)

18) $\frac{x}{81\sqrt{81 + x^2}} + C$

Objective: (7.4) Integrate Using Trigonometric Substitution

19) $\frac{49}{2}\sin^{-1}\left(\frac{x}{7}\right) + \frac{x\sqrt{49 - x^2}}{2} + C$

Objective: (7.4) Integrate Using Trigonometric Substitution

20) $\frac{1}{3}(x^2 + 3)^{3/2} - 3\sqrt{x^2 + 3} + C$

Objective: (7.4) Integrate Using Trigonometric Substitution

21) $\frac{2}{5}(x + 7)^{5/2} - \frac{14}{3}(x + 7)^{3/2} + C$

Objective: (7.4) Integrate Using Trigonometric Substitution

22) $\ln\left|\frac{(x + 3)^7}{(x + 7)^2}\right| + C$

Objective: (7.5) Evaluate Integral Using Partial Fractions I

23) $3 \ln|x - 5| + 2 \ln|x + 1| + C$

Objective: (7.5) Evaluate Integral Using Partial Fractions I

24) $5 \ln\left|\frac{x}{x + 2}\right| + \frac{1}{x + 2} + C$

Objective: (7.5) Evaluate Integral Using Partial Fractions II

25) $-\frac{1}{5(\ln x)^5} + C$

Objective: (7.6) Evaluate Integral

26) $\frac{1}{2}\tan^{-1}\left(\frac{x + 2}{2}\right) + C$

Objective: (7.6) Evaluate Integral

27) $\frac{\sqrt{2x - 7}}{7x} + \frac{2}{7\sqrt{7}}\tan^{-1}\sqrt{\frac{2x - 7}{7}} + C$

Objective: (7.6) Evaluate Integral Using Tables of Integrals

28) $\frac{1}{10}\ln 11$

Objective: (8.3) Evaluate Improper Integral I

29) 0
Objective: (8.3) Evaluate Improper Integral I

30) $-\frac{3}{64}$
Objective: (8.3) Evaluate Improper Integral I

31) $\frac{352}{459}$
Objective: (5.1) Approximate Area Using Finite Sum

32) 41
Objective: (5.1) Approximate Area Using Finite Sum

33) $\frac{8}{5}\sin 5x - \frac{8}{15}\sin^3 5x + C$
Objective: (8.2) Evaluate Integral (Powers of Sines and Cosines)

34) $\frac{7}{13}$
Objective: (8.2) Evaluate Integral (Product of Sines and Cosines)

35) $4\ln\left|\frac{x}{x+3}\right| + \frac{2}{x+3} + C$
Objective: (8.4) Evaluate Integral by Partial Fractions (Repeated Lin Factors)

36) $25\sin^{-1}\left(\frac{x}{5}\right) - x\sqrt{25-x^2} + C$
Objective: (8.5) Use Table To Evaluate Integral (Radical)

37) $\frac{27}{4}$
Objective: (8.6) Use the Trapezoidal Rule

38) 1
Objective: (8.7) Evaluate Improper Integral (Infinite Limits of Integration) II