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1. **(1 pt) Library/UVA-Stew5e/setUVA-Stew5e-C02S03-CalcLimits/2-3-12.pg**
Evaluate the limit

$$\lim_{x \to 5} \frac{x^2 - 3x - 10}{x - 5}$$

Enter **I** for ∞, **-I** for $-\infty$, and **DNE** if the limit does not exist.

_____

2. **(1 pt) Library/Union/setLimitConcepts/3-2-55.pg**

Let $f(x) = 7x^2 + 5$. Evaluate

$$\lim_{h \to 0} \frac{f(1+h) - f(1)}{h}.$$

(If the limit does not exist, enter "DNE".)

Limit = _____

3. **(1 pt) Library/Utah/Calculus_I/set5_The_Derivative/1210s5p2.pg**

Let

$$f(x) = \frac{x}{\cos x^2}.$$

$f'(x) =$ _____.

4. **(1 pt) Library/OSU/high_school_apcalc/dcrev2/prob2.pg**

Find the derivative of

$$f(x) = \frac{(4x+6)^5}{(3x-4)^6}$$

$f'(x) =$

_____

Find the derivative of

$$g(x) = \cos^5(\sqrt[6]{x})$$

$g'(x) =$

_____

5. **(1 pt) Library/UVA-Stew5e/setUVA-Stew5e-C03S03-RatesofChange/3-3-01.pg**

Suppose that a particle moves according to the law of motion

$$s = t^2 - 7t + 20, \qquad t \geq 0.$$

(A) Find the velocity at time t.

$v(t) =$ _____

(B) What is the velocity after 3 seconds?

Velocity after 3 seconds = _____

(C) Find all values of t for which the particle is at rest. (If there are no such values, enter 0. If there are more than one value, list them separated by commas.)

$t =$ _____

(D) Use interval notation to indicate when the particle is moving in the positive direction. (If the particle is never moving in the positive direction, enter "" without the quotation marks.)

Answer = _____

6. **(1 pt) Library/Indiana/Indiana_setIntegrals4FTC/ur_in_4_12.pg**

Let

$$f(x) = \begin{cases} 0 & \text{if } x < -4 \\ 5 & \text{if } -4 \le x < -1 \\ -2 & \text{if } -1 \le x < 3 \\ 0 & \text{if } x \ge 3 \end{cases}$$

and

$$g(x) = \int_{-4}^{x} f(t)dt$$

Determine the value of each of the following:
(a) $g(-6) =$ ___

(b) $g(-3) =$ ___

(c) $g(0) =$ ___

(d) $g(4) =$ ___

(e) The absolute maximum of $g(x)$ occurs when $x =$ ___ and is the value ___
It may be helpful to make a graph of $f(x)$ when answering these questions.

7. **(1 pt) Library/UVA-Stew5e/setUVA-Stew5e-C05S03-FundThmCalc/5-3-10.pg**

Use part I of the Fundamental Theorem of Calculus to find the derivative of

$$F(x) = \int_x^8 \tan(t^2)dt$$

$F'(x)$ = _____

[NOTE: Enter a function as your answer.]

8. **(1 pt) Library/ma123DB/set3/s7_4_31.pg**

The form of the partial fraction decomposition of a rational function is given below.

$$\frac{3x^2+2x+2}{(x-5)(x^2+4)} = \frac{A}{x-5} + \frac{Bx+C}{x^2+4}$$

$A =$ _____ $B =$ _____ $C =$ _____

Now evaluate the indefinite integral.

$\int \frac{3x^2+2x+2}{(x-5)(x^2+4)} dx =$ _____

9. **(1 pt) Library/Union/setIntByParts/mec_int1.pg**

Evaluate the indefinite integral.

$\int x\cos^2(4x)\,dx =$ _____ $+C$.

Hint: Integrate by parts with $u = x$.

10. **(1 pt) Library/UMN/calculusStewartET/s_7_1_prob07.pg**

If $g(1) = -2$, $g(5) = -5$, and $\int_1^5 g(x)\,dx = -5$, evaluate the integral $\int_1^5 xg'(x)\,dx$.

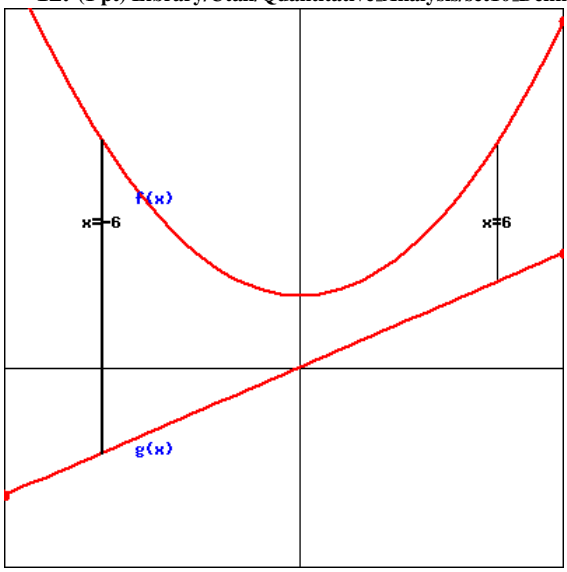
Answer: _____

11. **(1 pt) Library/ma122DB/set13/s6_5_1.pg**

Find the average value of $f(x) = x^4$ on the interval $[1,6]$.

Answer: _____

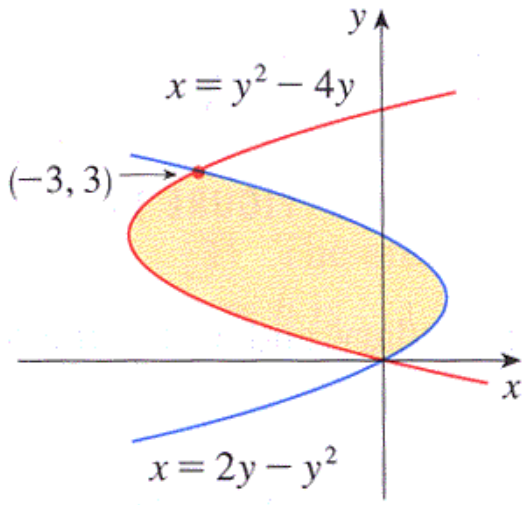
12. **(1 pt) Library/Utah/Quantitative_Analysis/set10_Definite_Integrals_Techniques_of_Integration/pr_6.pg**



Find the area enclosed between
$f(x) = 0.3x^2 + 5$
and
$g(x) = x$
From $x = -6$ to $x = 6$

13. **(1 pt) Library/UCSB/Stewart5_6_1/Stewart5_6_1_4/Stewart5_6_1_4.pg**

Find the area of the shaded region below.



Area = _____

14. **(1 pt) Library/Union/setIntLength/ur_in_21_2.pg**

Find the length of the curve defined by

$$y = 6x^{3/2} + 9$$

from $x = 4$ to $x = 10$.

The length is _____.

15. **(1 pt) Library/UCSB/Stewart5_8_1/Stewart5_8_1_18.pg**

Which of the following integrals represents the length of the curve $y = 2^x,\ \ 0 \le x \le 3$?

- A. $\int_0^3 \sqrt{1+2(\ln 2)^2 2^x}\,dx$
- B. $\int_0^3 \sqrt{1+2^{2x}}\,dx$
- C. $\int_0^3 \sqrt{1+2^x}\,dx$
- D. $\int_0^3 \sqrt{1+(\ln 2)^2 2^x}\,dx$
- E. $\int_0^3 \sqrt{1+(\ln 2)^2 2^2}\,dx$
- F. $\int_0^3 \sqrt{1+(\ln 2)^2 2^{2x}}\,dx$

16. **(1 pt) Library/Michigan/Chap8Sec2/Q15.pg**

Find the length traced out along the parametric curve $x = \cos(\sin(3t))$, $y = \sin(\sin(3t))$ as t goes through the range $0 \leq t \leq 1$. (Be sure you can explain why your answer is reasonable).

arc length = _____

17. **(1 pt) Library/Rochester/setIntegrals27SurfaceArea/ur_in_27_3.pg**

Find the area of the surface obtained by rotating the curve

$$y = 1 + 6x^2$$

from $x = 0$ to $x = 9$ about the y-axis.

18. **(1 pt) Library/Indiana/Indiana_setDerivatives20Antideriv/c3s10p4.pg**

A ball is shot at an angle of 45 degrees into the air with initial velocity of 49 ft/sec. Assuming no air resistance, how high does it go? (Hint: The acceleration due to gravity is 32 ft per second squared.)

How far away does it land?

19. **(1 pt) Library/WHFreeman/Rogawski_Calculus_Early_Transcendentals_Second_Edition/5_The_Integral/5.5_Net_Change_as_the_Integral_of_a_Rate-/5.5.7.pg**

A cat falls from a tree (with zero initial velocity) at time $t = 0$. How far does the cat fall between $t = 0.3$ s and $t = 1.3$ s? Use Galileo's formula $v(t) = -32t$ ft/s.

Answer: ___ ft.

20. **(1 pt) Library/UVA-Stew5e/setUVA-Stew5e-C06S03-VolumesShells/6-3-35.pg**

Find the volume of the solid obtained by rotating the region bounded by the given curves about the specified axis.

$$y = x^2 - 1x - 6, \quad y = 0;$$

about the x-axis.

Volume = _____

21. **(1 pt) Library/UMN/calculusStewartCCC/s_11_2_11.pg**

Find the sum of the following infinite series. If it is divergent, type "Diverges" or "D".

$$11+2+\frac{4}{11}+\frac{8}{121}+\cdots$$

Sum: _____

22. **(1 pt) Library/UMN/calculusStewartCCC/s_11_2_44.pg**

Consider the following series. Answer the following questions.

$$\sum_{n=0}^{\infty} \frac{(x+6)^n}{2^n}$$

1. Find the values of x for which the series converges.

Answer (in interval notation): _____

2. Find the sum of the series for those values of x.

Sum: _____

23. **(1 pt) Library/ma123DB/set10/s11_2_21.pg**

Determine whether the series is convergent or divergent. If convergent, find the sum; if divergent, enter *div* .

$$\sum_{n=1}^{\infty} \frac{n}{n+17}$$

Answer: _____

24. **(1 pt) Library/Dartmouth/setStewartCh12S2/problem_5.pg**

Consider the series

$$\sum_{n=1}^{\infty} \frac{n}{3n+7}$$

Determine whether the series converges, and if it converges, determine its value.

Converges (y/n): _____

Value if convergent (blank otherwise): _____

25. **(1 pt) Library/Utah/Calculus_II/set7_Infinite_Series/set7_pr15.pg**

Match each of the following with the correct statement.
C stands for Convergent, D stands for Divergent.

$$\sum_{n=2}^{\infty} \frac{7}{n^8 - 64}$$

$$\sum_{n=1}^{\infty} \frac{3 + 9^n}{6 + 6^n}$$

$$\sum_{n=1}^{\infty} \frac{\ln(n)}{8n}$$

$$\sum_{n=1}^{\infty} \frac{1}{6 + \sqrt[7]{n^3}}$$

$$\sum_{n=1}^{\infty} \frac{7}{n(n+7)}$$

26. **(1 pt) Library/FortLewis/Calc2/9-4-Ratio-test/ratio-04.pg**

Use the ratio test to determine whether $\sum_{n=10}^{\infty} \frac{n+8}{n!}$ converges or diverges.

(a) Find the ratio of successive terms. Write your answer as a fully simplified fraction. For $n \geq 10$,

$$\lim_{n\to\infty} \left| \frac{a_{n+1}}{a_n} \right| = \lim_{n\to\infty} \_\_\_\_\_$$

(b) Evaluate the limit in the previous part. Enter ∞ as *infinity* and $-\infty$ as *-infinity.* If the limit does not exist, enter *DNE.*

$\lim_{n\to\infty} \left| \frac{a_{n+1}}{a_n} \right|$ = _____

(c) By the ratio test, does the series converge, diverge, or is the test inconclusive? ?

27. **(1 pt) Library/UMN/calculusStewartCCC/s_11_6_1.pg**

What can you say about the series $\sum a_n$ in each of the following cases using the Ratio Test? Answer "Convergent," "Divergent," or "Inconclusive."

1. $\lim_{n\to\infty} \left|\frac{a_{n+1}}{a_n}\right| = 0.25$

2. $\lim_{n\to\infty} \left|\frac{a_{n+1}}{a_n}\right| = 1$

3. $\lim_{n\to\infty} \left|\frac{a_{n+1}}{a_n}\right| = 4$

28. **(1 pt) Library/ma123DB/set11/s11_5_5.pg**

Determine whether the following series converges or diverges.

$$\sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{\sqrt{n}}$$

Input C for convergence and D for divergence: ___

Note: You have only one chance to enter your answer.

29. **(1 pt) Library/WHFreeman/Rogawski_Calculus_Early_Transcendentals_Second_Edition/10_Infinite_Series/10.4_Absolute_and_Conditional_Convergence-/10.4.15.pg**

Approximate the value of the series to within an error of at most 10^{-4}.

$$\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{(n+77)(n+71)}$$

According to Equation (2):

$$|S_N - S| \leq a_{N+1}$$

what is the smallest value of N that approximates S to within an error of at most 10^{-4}?

$N =$ _____

$S \approx$ _____

30. **(1 pt) Library/ma123DB/set12/s11_8_18.pg**

Find all the values of x such that the given series would converge.

$$\sum_{n=1}^{\infty} \frac{(x-10)^n}{10^n}$$

Answer: _____

Note: Give your answer in **interval notation**

31. **(1 pt) Library/WHFreeman/Rogawski_Calculus_Early_Transcendentals_Second_Edition/10_Infinite_Series/10.7_Taylor_Series/10.7.1.pg**

Write out the first four terms of the Maclaurin series of $f(x)$ if

$$f(0) = 11, \qquad f'(0) = 12, \qquad f''(0) = 7, \qquad f'''(0) = 11$$

$f(x)$ = _____ $+\cdots$

32. Match each of the Maclaurin series with the function it represents.

A. $\sin(x)$
B. $\cos(x)$
C. e^x
D. $\arctan(x)$

1. $\displaystyle\sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!}$
2. $\displaystyle\sum_{n=0}^{\infty} \frac{(-1)^n x^{2n+1}}{2n+1}$
3. $\displaystyle\sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{(2n+1)!}$
4. $\displaystyle\sum_{n=0}^{\infty} \frac{x^n}{n!}$

33. **(1 pt) Library/Dartmouth/setStewartCh12S10/problem_1.pg**

The function $f(x) = \sin(4x)$ has a Maclaurin series. Find the first 4 nonzero terms in the series, that is write down the Taylor polynomial with 4 nonzero terms.

34. **(1 pt) Library/FortLewis/Calc2/10-2-Taylor-series/Taylor-series-01.pg**

Find the first four terms of the Taylor series for the function $\frac{5}{x}$ about the point $a = -2$. (Your answers should include the variable x when appropriate.)

$\frac{5}{x}$ = _____ + _____ + _____ + _____ + ...

35. **(1 pt) Library/Michigan/Chap10Sec2/Q31.pg**

By recognizing each series below as a Taylor series evaluated at a particular value of x, find the sum of each convergent series.

A. $1+4+\frac{4^2}{2!}+\frac{4^3}{3!}+\frac{4^4}{4!}+\cdots+\frac{4^n}{n!}+\cdots=$ _____

B. $4-\frac{4^3}{3!}+\frac{4^5}{5!}-\frac{4^7}{7!}+\cdots+\frac{(-1)^n 4^{2n+1}}{(2n+1)!}+\cdots=$ _____

36. **(1 pt) Library/Dartmouth/setStewartCh12S10/problem_7.pg**

Find the sum of the series

$$\sum_{n=0}^{\infty} (-1)^n \frac{x^{11n}}{n!}$$

It will be a function of the variable x.

37. **(1 pt) Library/Michigan/Chap10Sec2/Q43.pg**

Suppose that you are told that the Taylor series of $f(x) = x^5 e^{x^3}$ about $x = 0$ is

$$x^5 + x^8 + \frac{x^{11}}{2!} + \frac{x^{14}}{3!} + \frac{x^{17}}{4!} + \cdots .$$

Find each of the following:

$\frac{d}{dx}\left(x^5 e^{x^3}\right)\Big|_{x=0} =$ _____

$\frac{d^{11}}{dx^{11}}\left(x^5 e^{x^3}\right)\Big|_{x=0} =$ _____