1.(1 pt) Evaluate the integral.

$$\int \frac{1}{(x-3)(x+3)}dx$$

2.(1 pt) Evaluate the indefinite integral.

$$\int \frac{1}{(x-2)(x+4)}dx$$

3.(1 pt) Evaluate the indefinite integral.

$$\int \frac{-1}{x^2-6x+9}dx$$

4.(1 pt) Evaluate the integral.

$$\int_{-2}^{4} \frac{1}{(x+9)(x^2+16)}dx$$

5.(1 pt) Evaluate the integral.

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

6.(1 pt)
Evaluate the integral.

$$\int_{4}^{5} \frac{6x-9}{x^2-3x+2}dx$$

7.(1 pt) Evaluate the integral.

$$\int_{0}^{1} \frac{6x+24}{x^2+8x+12}dx$$

8.(1 pt) Evaluate the integral.

$$\int_{5}^{6} \frac{5x-11}{x^2-4x+3}dx$$

9.(1 pt) Evaluate the integral.

$$\int \frac{3x+7}{x^2+4x+13}dx$$

10.(1 pt) Evaluate the indefinite integral.

$$\int \frac{x+5}{x^2+10x+26}dx$$

______________________ $+C$

11.(1 pt) Write out the form of the partial fraction decomposition of the function appearing in the integral:

$$\int \frac{2x-63}{x^2+5x-66}dx$$

Determine the numerical values of the coefficients, A and B, where A ≤ B.

$$\frac{A}{denominator} + \frac{B}{denominator}$$

A = ______________ B = ______________

12.(1 pt) Write out the form of the partial fraction decomposition of the function:

$$Q = \int_{3}^{11} \frac{11x}{x^2+6x+9}dx$$

Determine the numerical values of the coefficients, A and B, where $B \leq A$

$$\frac{A}{denominator} + \frac{B}{denominator}$$

A = ______________ B = ______________

13.(1 pt) Write out the form of the partial fraction decomposition of the function:

$$Q = \int_{4}^{12} \frac{3x+8}{x^2+6x+9}dx$$

Determine the numerical values of the coefficients, A and B, where A ≤ B.

$$\frac{A}{denominator} + \frac{B}{denominator}$$

A = ______________ B = ______________

14.(1 pt) Evaluate the integral.

$$\int \frac{8x^2-63x+34}{x^3-10x^2+12x+72}dx$$

15.(1 pt) The answer to this question contains absolute values.
The absolute value of a quantity w should be written abs(w).
Evaluate the integral.

$$\int \frac{1x^2+19x-27}{x^3+1x^2+4x+30}dx$$

16.(1 pt) **Note:** You can get full credit for this problem by just entering the final answer (to the last question) correctly. The initial questions are meant as hints towards the final answer and also allow you the opportunity to get partial credit.

Consider the indefinite integral $\int \frac{4x^3+4x^2-57x-60}{x^2-16}\,dx$

Then the integrand decomposes into the form

$$ax+b+\frac{c}{x-4}+\frac{d}{x+4}$$

where
a = ______________
b = ______________
c = ______________
d = ______________

Integrating term by term, we obtain that $\int \frac{4x^3+4x^2-57x-60}{x^2-16}\,dx$ =

______________________ $+C$

17.(1 pt) The form of the partial fraction decomposition of a rational function is given below.

$$\frac{3x^2+1x+23}{(x-4)(x^2+9)} = \frac{A}{x-4} + \frac{Bx+C}{x^2+9}$$

$A =$ ______ $B =$ ______ $C =$ ______

Now evaluate the indefinite integral.

$$\int \frac{3x^2+1x+23}{(x-4)(x^2+9)}dx$$

18.(1 pt) The form of the partial fraction decomposition of a rational function is given below.

$$\frac{-9x^2+1x-17}{(x-1)(x^2+4)} = \frac{A}{x-1} + \frac{Bx+C}{x^2+4}$$

$A =$ ______ $B =$ ______ $C =$ ______

Now evaluate the indefinite integral.

$$\int \frac{-9x^2+1x-17}{(x-1)(x^2+4)}dx$$

19.(1 pt) **Note:** You can get full credit for this problem by just entering the final answer (to the last question) correctly. The initial questions are meant as hints towards the final answer and also allow you the opportunity to get partial credit.

Consider the indefinite integral $\int \frac{10x^3+6x^2+5x+3}{x^4+1x^2}\,dx$

Then the integrand has partial fractions decomposition

$$\frac{a}{x^2} + \frac{b}{x} + \frac{cx+d}{x^2+1}$$

where

$a =$ ______

$b =$ ______

$c =$ ______

$d =$ ______

Integrating term by term, we obtain that $\int \frac{10x^3+6x^2+5x+3}{x^4+1x^2}\,dx$ =

______ $+C$

20.(1 pt) Evaluate the indefinite integral.

$$\int \frac{3x^3-2x^2+0}{(x^4+0x^3)}dx$$

21.(1 pt) Evaluate the indefinite integral.

$$\int \frac{x^3+79}{x^2+5x+4}dx$$

22.(1 pt) Evaluate the indefinite integral.

$$\int \frac{1x^3+19x^2+9x-12}{(x^4+4x^3)}dx$$

23.(1 pt) Evaluate the integral.

$$\int_{-3}^{1} \frac{x^3-4}{(x+5)(x+6)}dx$$

24.(1 pt) Evaluate the integral.

$$\int \frac{-36e^x-168}{e^{2x}+11e^x+28}dx$$

25.(1 pt)

Let $f(x)$ be a quadratic function such that $f(0) = -4$ and

$$\int \frac{f(x)}{x^2(x-9)^7}\,dx$$

is a rational function.

Determine the value of $f'(0)$.

$f'(0) =$ ______

26.(1 pt) Consider the integral

$$\int \frac{x^{21}-5x^{14}+9x^7-38}{\left(x^3-5x^2+4x\right)^3\left(x^4-256\right)^2}\,dx$$

Enter a T or an F in each answer space below to indicate whether or not a term of the given type occurs in the general form of the complete partial fractions decomposition of the integrand. $A_1, A_2, A_3 \ldots$ and $B_1, B_2, B_3, \ldots$ denote constants.

You must get all of the answers correct to receive credit.

— 1. $\frac{A_2x+B_2}{\left(x^2+16\right)^2}$

— 2. $\frac{B_1}{x+1}$

— 3. $\frac{A_8x+B_8}{(x-4)^2}$

— 4. $\frac{B_5}{(x-4)^2}$

— 5. $\frac{A_3x+B_3}{\left(x^2-16\right)^2}$

— 6. $\frac{B_7}{(x+4)^2}$

— 7. $\frac{B_4}{(x+4)^3}$

— 8. $\frac{B_6}{(x-4)^3}$

27.(1 pt) (Continuation of Problem 7) Consider the integral

$$\int \frac{x^{21}-5x^{14}+9x^7-38}{\left(x^3-5x^2+4x\right)^3\left(x^4-256\right)^2}\,dx$$

Enter a T or an F in each answer space below to indicate whether or not a term of the given type occurs in the general form of the complete partial fractions decomposition of the integrand. $A_1, A_2, A_3 \ldots$ and $B_1, B_2, B_3, \ldots$ denote constants.

You must get all of the answers correct to receive credit.

— 1. $\frac{B_2}{(x-4)^4}$

— 2. $\frac{B_1}{(x-1)^3}$

— 3. A_3x^5

— 4. A_1x

— 5. $\frac{B_3}{(x-4)^5}$

— 6. A_2x^4

— 7. $\frac{B_4}{(x-1)^2}$

28.(1 pt) (Continuation of Problem 7) Consider the integral

$$\int \frac{x^{21}-5x^{14}+9x^7-38}{\left(x^3-5x^2+4x\right)^3\left(x^4-256\right)^2}\,dx$$

Enter a T or an F in each answer space below to indicate whether or not a term of the given type occurs in the general form of the complete partial fractions decomposition of the integrand. $A_1, A_2, A_3 \ldots$ and $B_1, B_2, B_3, \ldots$ denote constants.

You must get all of the answers correct to receive credit.

— 1. $\frac{B_1}{x-1}$

— 2. A_1x^3

— 3. A_3
— 4. A_2x
— 5. $\frac{B_2}{x^2}$
— 6. $\frac{B_4}{(x-16)^2}$
— 7. $\frac{B_3}{x^3}$

29.(1 pt) (Continuation of Problem 7) Consider the integral

$$\int \frac{x^{21}-5x^{14}+9x^7-38}{(x^3-5x^2+4x)^3\,(x^4-256)^2}\,dx$$

Enter a T or an F in each answer space below to indicate whether or not a term of the given type occurs in the general form of the complete partial fractions decomposition of the integrand. $A_1, A_2, A_3 \ldots$ and $B_1, B_2, B_3, \ldots$ denote constants.
You must get all of the answers correct to receive credit.

— 1. A_1x^2
— 2. $\frac{B_1}{x-4}$
— 3. $\frac{A_7x+B_7}{(x+4)^2}$
— 4. $\frac{B_4}{(x-1)^4}$
— 5. $\frac{A_2x+B_2}{\left(x^4+256\right)^2}$
— 6. $\frac{B_6}{x+4}$
— 7. $\frac{A_3x+B_3}{x^2+16}$
— 8. $\frac{B_5}{x^4}$

30.(1 pt) Consider the integral

$$\int \frac{(1+6x)^{10}}{(x^3-x)^2\,(x^2-9x+8)}\,dx$$

Enter a T or an F in each answer space below to indicate whether or not a term of the given type occurs in the general form of the complete partial fractions decomposition of the integrand. $A_1, A_2, A_3 \ldots$ and $B_1, B_2, B_3, \ldots$ denote constants.

— 1. $\frac{A_7}{x}$
— 2. A_4x^2
— 3. $\frac{B_8}{(x-1)^3}$
— 4. $\frac{A_1}{x^2}$
— 5. $\frac{A_8}{x^3}$
— 6. $\frac{B_5}{x+8}$
— 7. $\frac{A_{20}x+B_{20}}{x^3-x}$
— 8. $\frac{B_3}{(x+8)^2}$
— 9. $\frac{A_{15}x+B_{15}}{\left(x^2-1\right)^2}$
— 10. A_6x
— 11. $\frac{B_2}{x-1}$
— 12. $\frac{A_{10}x+B_{10}}{x^2-9x+8}$
— 13. $\frac{B_6}{x-8}$
— 14. $\frac{A_9x+B_9}{\left(x^3-x\right)^2}$
— 15. $\frac{B_{11}}{(x+1)^2}$
— 16. $\frac{B_1}{(x+1)^3}$
— 17. $\frac{B_7}{(x-1)^2}$
— 18. $\frac{B_4}{x+1}$
— 19. A_3x^3
— 20. A_2