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Indefinite integral worksheet pdf

Mobile Note They appear to be on a device with a narrow screen width (i.e. You are probably on a mobile phone). Due to the nature of mathematics on this page, it is the best view in landscape mode. If your device is not in landscape mode, many of the equations run off the side of the device (should be able to scroll to see them), and some of the menu items are truncated due to the narrow screen width. In case of problems 1 - 21 evaluate the given integral. Here is a graphical preview for all Indefinite Integration for Calculus Worksheets. You can select different variables to customize this indefinite integration for Calculus Worksheets to your needs. The Indefinite Integration for Calculus Worksheets are created randomly and will never be repeated, so you have an endless range of quality indefinite integration for Calculus Worksheets that you can use in the classroom or at home. 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Replacement with Trigonometric Functions Worksheets This Calculus - Indeterminate Integration Worksheet leads to problems involving the use of substitution to find the integral trigonometric functions. Integration by Parts Worksheets This Calculus - Indeterminate Integration Worksheet leads to problems that affect the indeterminate integrals through the use of integration by parts. Replacement with inverse trigonometric functions worksheets This Calculus - Indefinite Integration Worksheet leads to problems that involve the integration of inverse trigonometric functions through substitution. Let $f be any function and $F - their antiderivatives. The set of all anti-derivatives of $f is called an indeterminate integral of the function, $f by the term int f(x) dx = F(x) + C. $C. This means that if we know one antiderivative $F the function $f, then the other, which we can write in the form $F(x) + C. We do not have strict rules for the calculation of antiderivatives (indefinite simon. Most of the anti-derivatives we know come from the table of derivatives that we read in the opposite direction. Table of basic integrals int dx int dx = x + C int n dx = fracxn +1 + N+1 + Quad neq 1 int frac{1} x dx = ln |x| + C-No. , frac{1} x- dx = - sfrac{1}-(n-1)x - 1- + C, quad n eq 1>{1} aeq 1- - sin x dx = - écos x + C' écos x dx = sin x + C' Table of integral rational functions example 1. Determine the solution of .int (2 - 3x + x'2) Due to the additivity and linearity properties of the integral, we have the property int (2 - 3x + x 2)dx = 2 'int dx - 3 'int x dx + 'int x'2 dx. From the table of the integral, we read ,int (2 - 3x + x 2)dx = 2x - sfrac{3}{2} x-2 + sfrac{1}{3}x 3 + C. Example 2. Determine the solution for the solution. Dx = int ('{1}' (sfracxx{2} - sfrac{1},2x, right) dx, s. = frac{1}{2} {1}we have frac{1}{2} left ("{1}{1}{2}{1}' From the table of indeterminate integrals we read: Frac{1}{2} left ('int x dx" ' 'int{1} {1}{2}{1}{2}{1}" '= fracx2 {4} + frac{1} , 2x + C, that's int frac3 -1,2x2 dx = fracx{1}{4} ,frac'sin 2x + 3 , sin.2 x ' sin x ' dx . Since sin 2x = 2 sin x cos x , we can write, int (int) , sin2x , 2 x , 2 'sin x 'cos x'sin x' + 'frac'3 'sin'2 x'sin x' 'right' dx 'By the linearity and additivity properties of the integral'. , we have int (2 x + 3 x sin x right) = 2 ,int cos x dx + 3 int sin x dx. Integrals that we read: 2 , 2 , We use the reverse chain rule of differentiation of composite functions and thus get the method called substitution method. The chain rule: Frac $g (dx) f(g(x)) = f'(g(x)) cdot g'(x). I 'subseteq 'mathbb'R' is a differentiable and continuous function on $I, then "int f(g(x)) g'(x) dx = 'int f(u) you ,- where $g(x) = u' and $g'(x) dx = du' First, we have to choose a substitution. Substitution is not determined in advance, only with the exercises we can discover the easiest way. Then we have to express the variable $x through $u and connect $du and $dx. We change the integrand and $dx with expressions by the variable $u and calculate the integral. The result that we write as a function of the variables $x, i.e. we return a replacement. Example 4. Determine the solution . We choose a substitution $u= sqrt3+x, (u ,ge 0 $dx $x). by changing $x with $u we have: int 3 + x dx = int u 2u du = int 2u2 you. We can write from the linearity property of the integrals. : 2 € int u-2 du = frac{2}{3} u-3 + C. Finally, the result that we need to write as a function of the variables $x: Frac{2}{3} u-3 + C frac{2}{3} sqrt (3+x) , 3, and that's int sqrt 3 +x dx = frac{2}{3} sqrt (3+x) Determine the solution of "int'frac'2x + '1'x'2 + x -3'dx.' We'll choose a substitution = x 2 + x - 3 . Therefore, we have frac (frac) = 2x +1,Rightarrow dx = frac2x+1. By replacing $x 2 + x - 3 by $u and $dx by frac 2x+1 we get: Dx = int (int) ,frac2x+1 (" ' 'frac'2x'2x'2x'2x=1', ' By returning a replacement we get the final result, the final result int frac 2x + 1x2 + x -3 dx = ln |x2 + x - 3| + C. example 6. Determine the solution int frac ln x dx. We choose a replacement $u = . Here follows: frac and fra $x $dx $u{1}c-from the table of integrals we read: int u du = frac{1}{2} u2 + C, that is int frac ln dx = frac{1}{2} n2 x + C. Example 7. Determine the solution of .int x dx. Since we can write xx xin x in the coc x = fact, we can write in the file int x dx = int and We choose a replacement $u = sin x. Here's what follows. we have int (int) frac cos x sin x dx = int frac cos x (cdot, frac du (- + C. . By returning a substitution we get the option int x cot x dx = ln | Sin x We use the same principle for the calculation of the specific integral. The result that we do not have to write as a function of the variable $x, because the result is a number. Instead, together with the integrand, we are changing the lower and upper limits of integration. Example 8. Determine the solution of int_{0}, frac {2}, cos4 x sin 3 x dx. We choose $u = . This is followed by the sin x Longrightarrow dx = fracdu. The lower and upper bounds are transformed in the following ways: '$x = 0 'Longrightarrow u = 'cos 0 = 'cos x = '{2} $x'{2} = 0 {1} int_{0} {1} int_{0} {2} int_{0}. 2) you. this is : int_{0} {1} u.cdot (-sin2) du = int_{0}{1} u'4 cdot (-1)(1 – 'cos'2 x) du'= 'int_{0}'{1} u'4 cdot (u-2 -1) you = int_{0} {1} (u6 – u4) you and int_{0} {1} u-6 you – int_{0}{1} u'4 du = 'frac'u'{7} 'bigg|_{0}'{1} - 'frac'u'5'{5}'bigg|_{0}'{1} = – 'frac{2}{35}' integration by parts We cannot calculate all the integral by using the method of replacement. Therefore, we need to use different methods for calculating the simple integral as int x ln x. Split integration is the only useful way to calculate integrals. Let $u and $v and $v and functions of the variables be $x. The formula for deriving the product can be written in the corresponding form: $u(x)v(x) = int [u'(x)v(x)v(x)v)v. (x)] dx = 'int u'(x) v(x) dx + 'int u(x)v'(x) dx.' So we get: "int u"v'(x) dx = u(x)v(x)v(x) - 'int u'(x)v(x) dx , or more simply 'int u v' dx = uv - 'int u' v dx.' The above formula is called the formula for integration by parts. The method of integration by parts The integrand write as a product of the functions $u and $v. Calculate the additional integral $v= 'int v' dx'. The function $v' must be chosen in such a way that its integral is easy to determine. Calculate the derivat $u. Write the formula for integration by part: .int uv' dx = uv - 'int u' v dx.' Example 9. Determine the $int Sint x -Sin x dx. We choose $v' = sin x dx and $u = x. Now we calculate the integral $v= int v' dx, which is $v = sin x Rightarrow v= int sin x dx = - cos x + C. The derivation of $u is equal to $u = x Rightarrow u = 1. : . Finally, we have the option int x sin x dx = x cdot x x + sin x . In some cases, integration must be repeated by part. Example 10. Determine the solution of .int ex x x dx. We choose $u = ex and $v' = 'cos x dx'. The following: $v = int x Longrightarrow v Sin x $du $du = ex dx $w $t. This is followed by the s-w = int (int) x Longrightarrow w = cos x $dt = ex dx, this is int ex cos x dx =ex x cdot x x int e x cdot x – left/ , we have the number 2 ,int e'x 'cos x dx = e'x ('sin x + 'cos x') + C,' which is '{1} {2}'integral is valid for integration by parts: see int_ , int_ , determine the solution of int_{2} {3} x. We choose $u= x and $v'= e'x dx' . Following is the option $v = int e x dx Longrightarrow v = ex, $du =dx. we have: .int_{2}.{3} x e x = x cdot ex bigg|_{2} 3 - int_{2}{3} ex dx x x cdot e x bigg|_{2} 3 - ex ,bigg|_2'3'=(3 'cdot e'3 - 2 'cdot e'2) - (e'3 - e'2) "=2 e'3' 3 - e' 2.

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