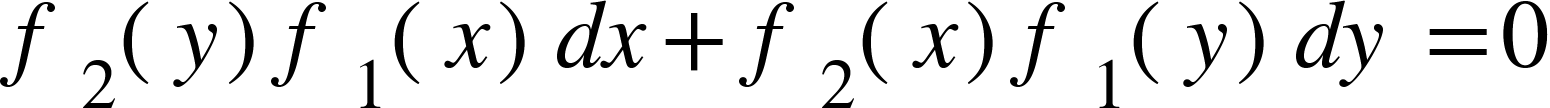
***SE***

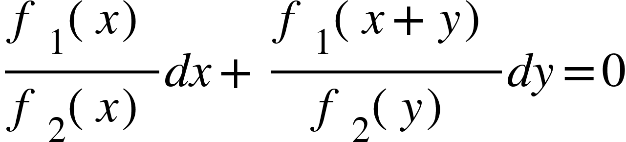
# For example, the equation {"mathml":"<mml:math style=\"font-family:stix;font-size:16px;\" xmlns:m=\"http://schemas.openxmlformats.org/officeDocument/2006/math\" xmlns:mml=\"http://www.w3.org/1998/Math/MathML\"><mml:mstyle mathsize=\"16px\"><mml:mfenced separators=\"|\"><mml:mrow><mml:mi>x</mml:mi><mml:mo>-</mml:mo><mml:mn>4</mml:mn></mml:mrow></mml:mfenced><mml:msup><mml:mi>y</mml:mi><mml:mn>4</mml:mn></mml:msup><mml:mi>d</mml:mi><mml:mi>x</mml:mi><mml:mo>-</mml:mo><mml:msup><mml:mi>x</mml:mi><mml:mn>3</mml:mn></mml:msup><mml:mfenced separators=\"|\"><mml:mrow><mml:msup><mml:mi>y</mml:mi><mml:mn>2</mml:mn></mml:msup><mml:mo>-</mml:mo><mml:mn>3</mml:mn></mml:mrow></mml:mfenced><mml:mi>d</mml:mi><mml:mi>y</mml:mi><mml:mo>=</mml:mo><mml:mn>0</mml:mn></mml:mstyle></mml:math>","origin":"MathType Legacy","version":"v3.18.2"} is a separable equation.

.

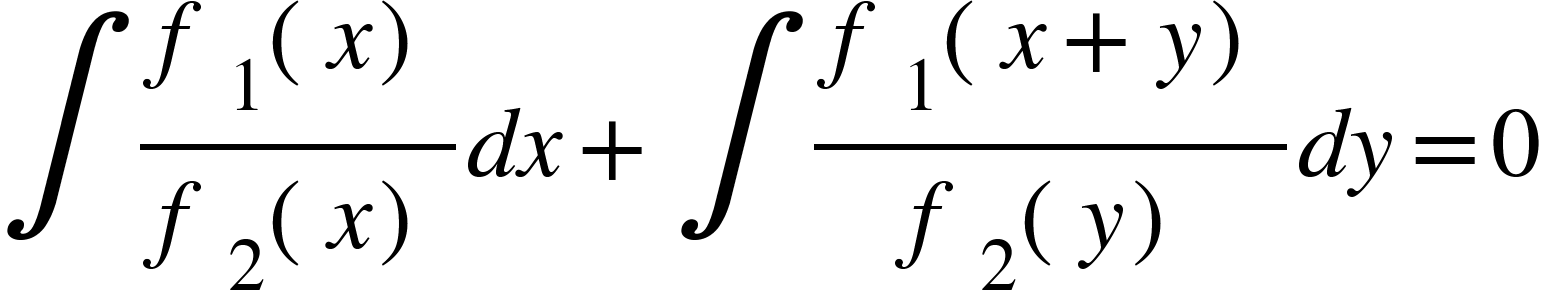
The separable equation,

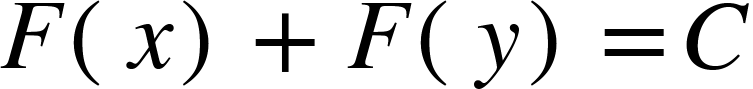


Separating variables and we get,

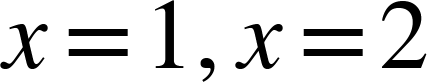
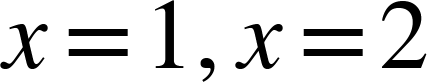


Integrating it,

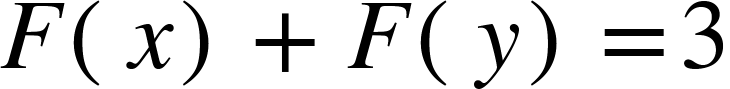




Where C is an arbitrary constant which is the required general solution.

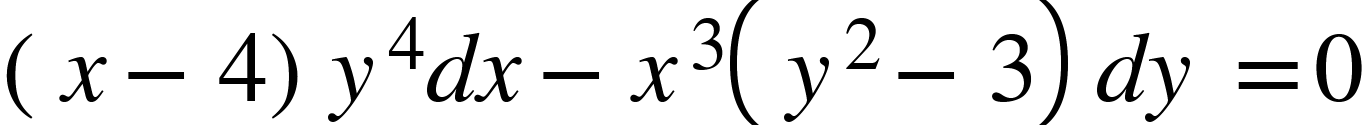
 then 

Therefore,



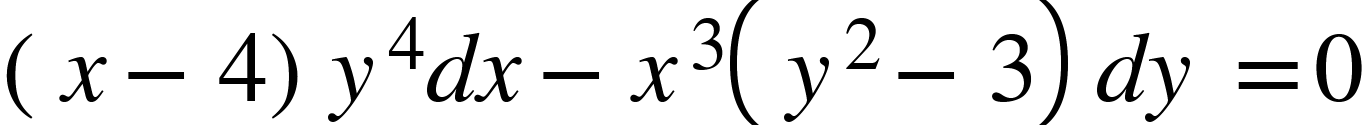
It is particular solution which we get from general equation.

**PROBLEM-1:**



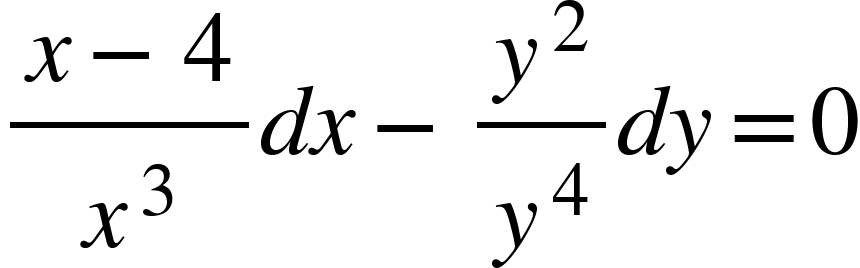
**Solution:**

Given that,

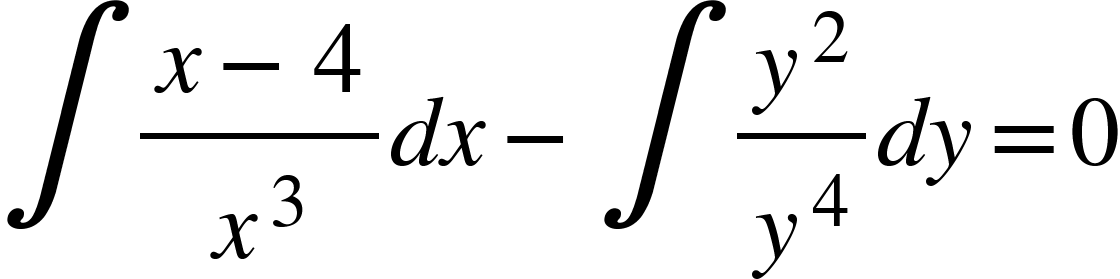


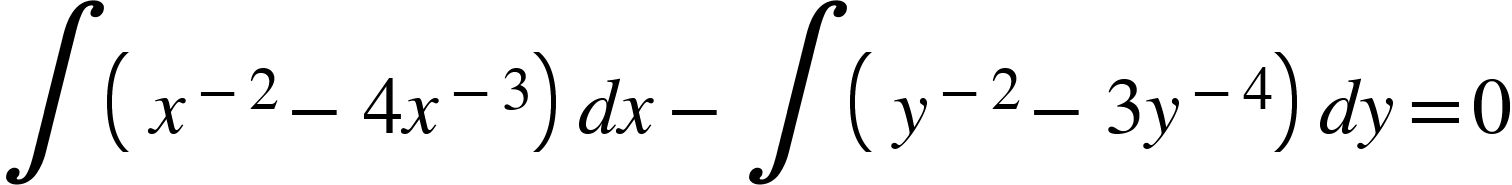
This is a separable equation

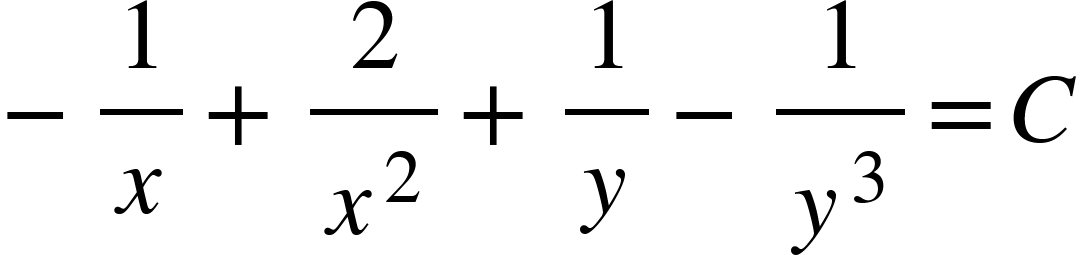
Separating variables and we get,



Integrating and we get,

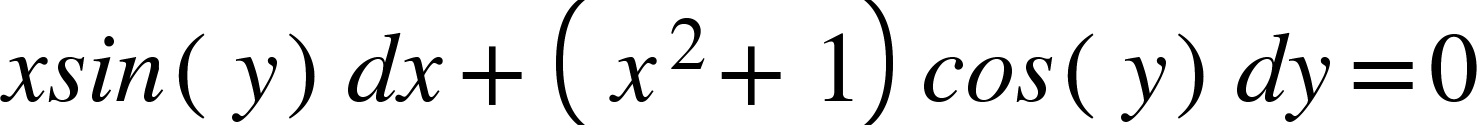


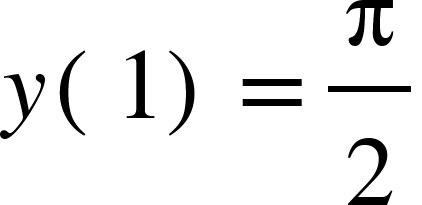




Where C is an arbitrary constant which is the required general solution.

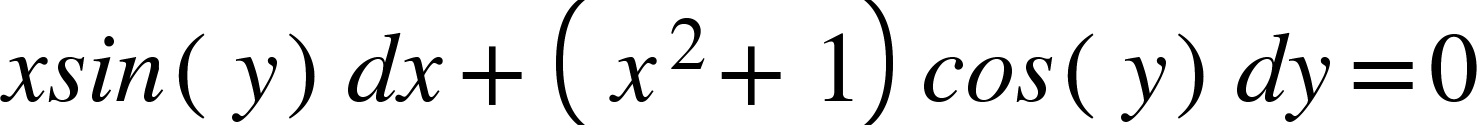
**PROBLEM-2:**



And the initial condition {"mathml":"<math xmlns=\"http://www.w3.org/1998/Math/MathML\" style=\"font-family:stix;font-size:16px;\"/>","origin":"MathType for Microsoft Add-in"}

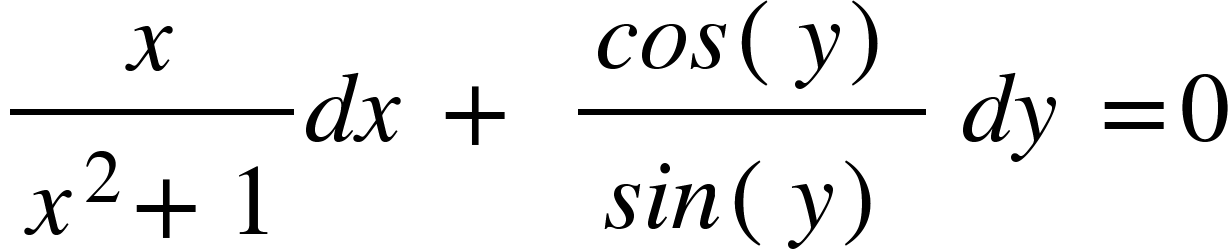
**Solution:**

Given that,

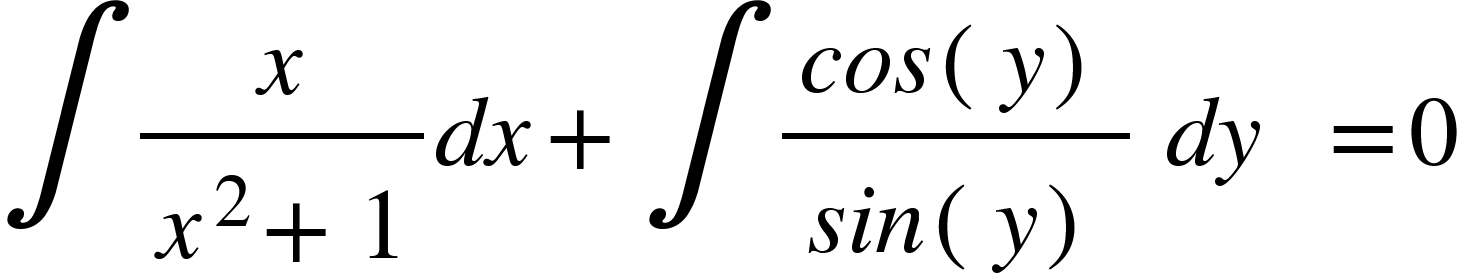


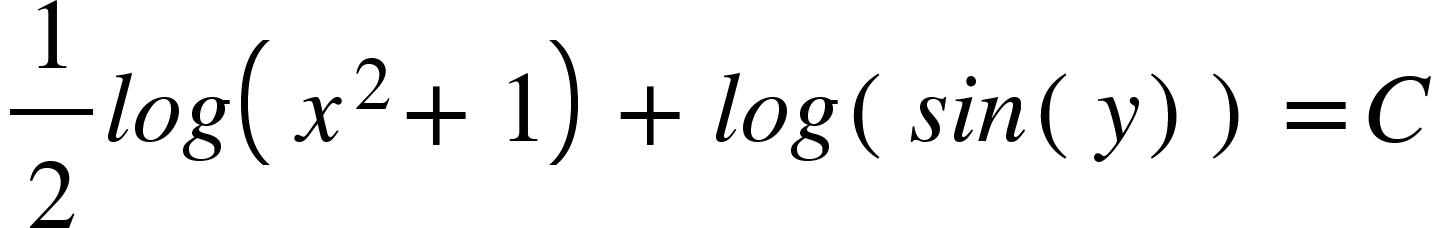
This is a separable equation

Separating variables, we get

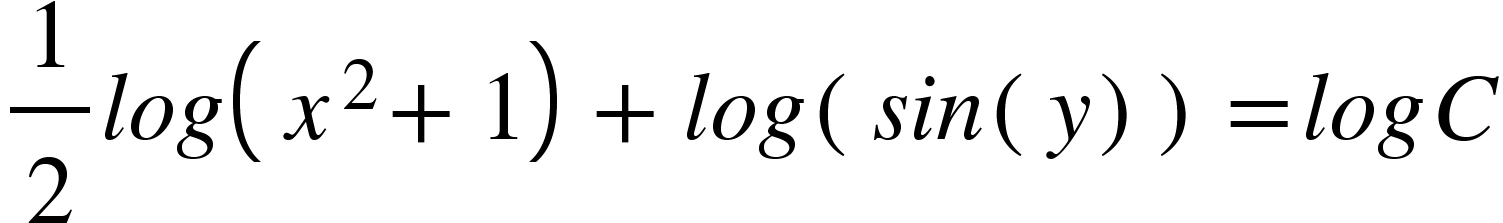


Integrating and we get,



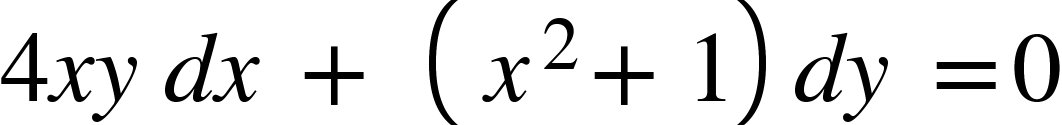


Or,



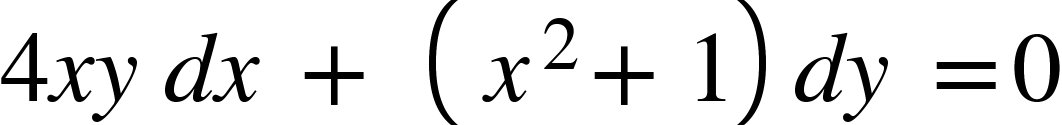
Where C is an arbitrary constant which is the required general solution.

**Exercise:**



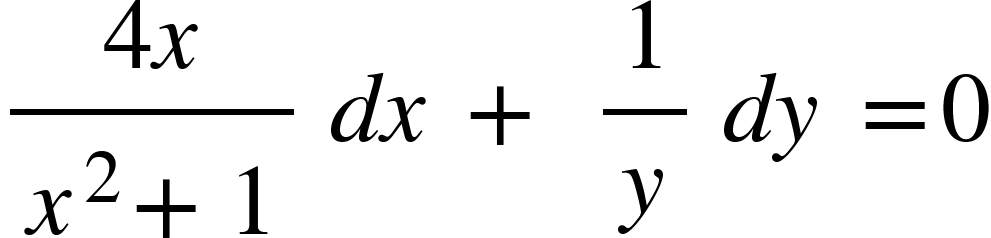
1.

Solution:

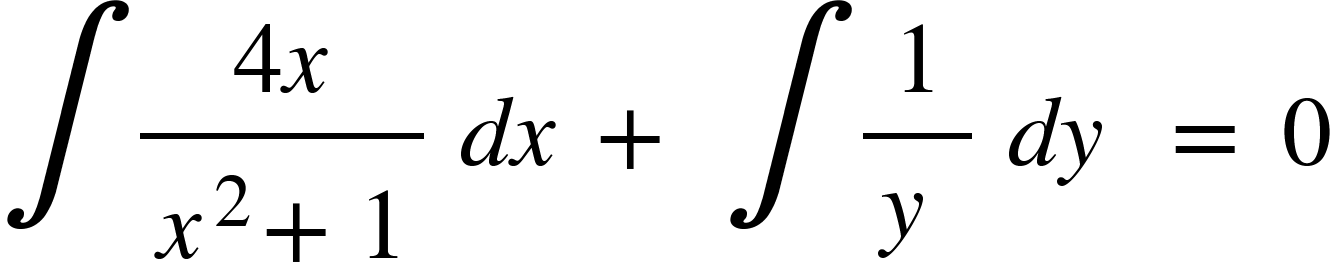


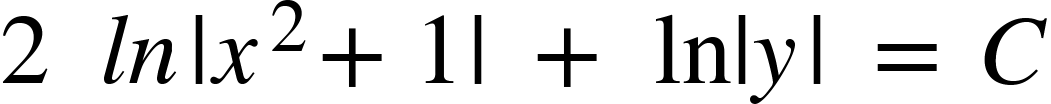
This is a seperable equation.

Seperating variable we gets,

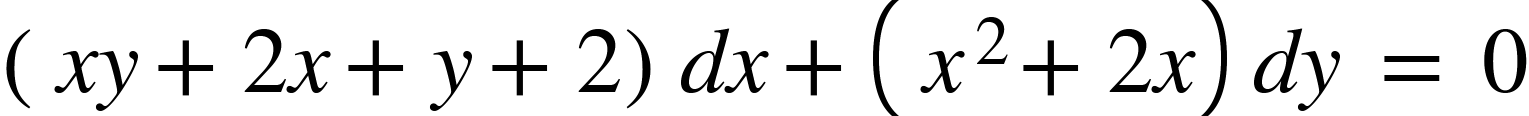


next we integrate,





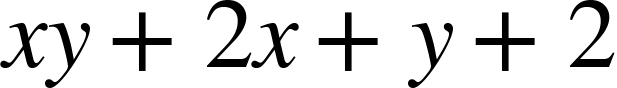
where C is the arbitrary constant which is the required general solution.

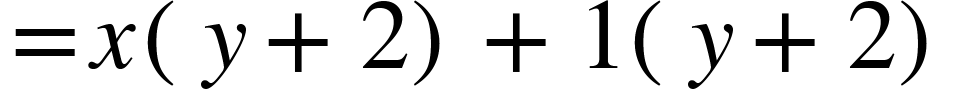


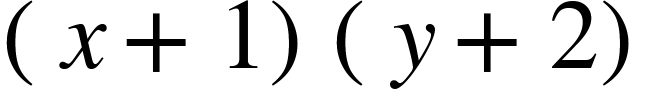
2.{"mathml":"<math xmlns=\"http://www.w3.org/1998/Math/MathML\" style=\"font-family:stix;font-size:16px;\"/>","origin":"MathType for Microsoft Add-in"}

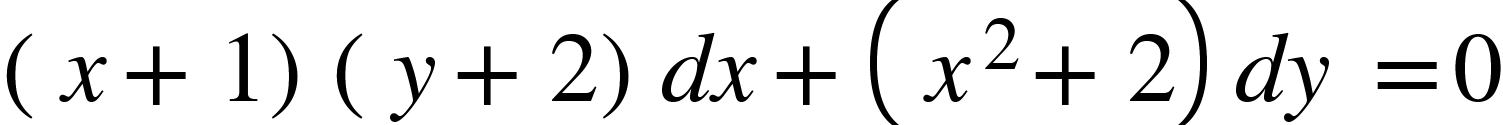
Solution:

Since,





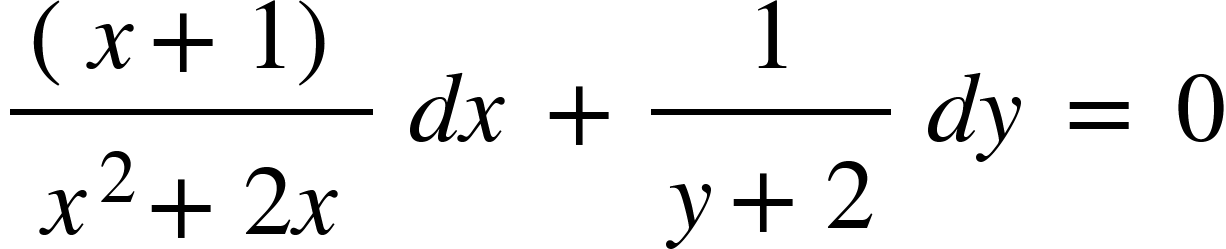




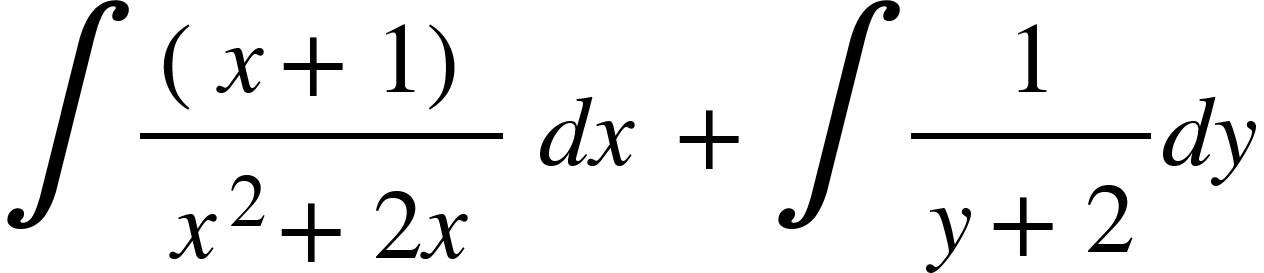
The DE can be rewritten as,

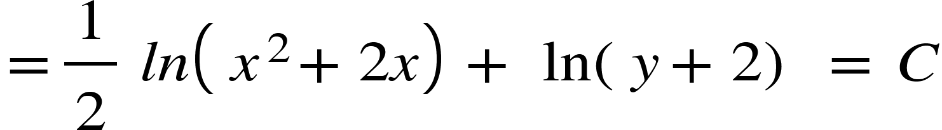
This is a separable equation

Separating variables, we get

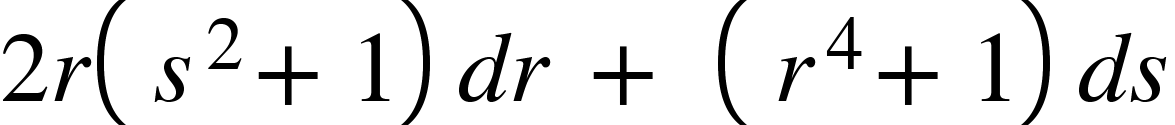


Integrating and we get,



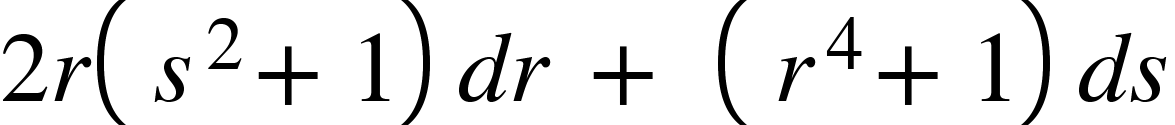


Where C is an arbitrary constant which is the required general equation.



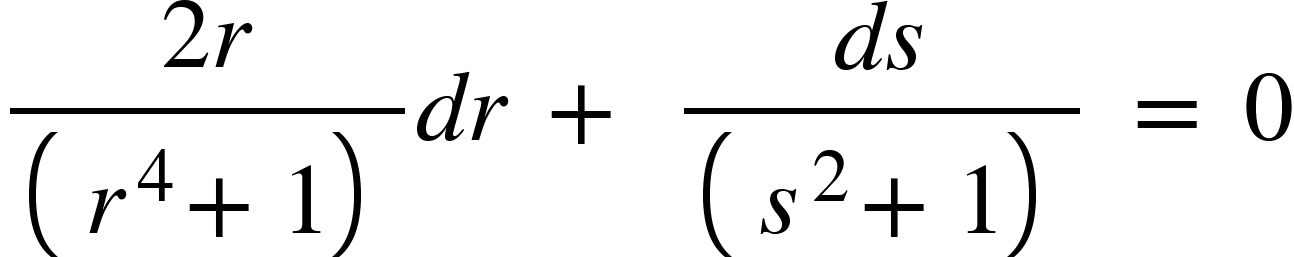
3.

**Solution:**

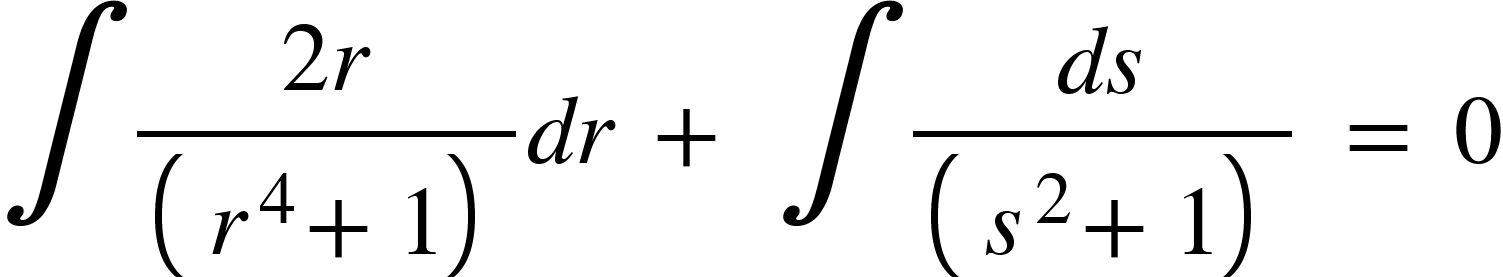


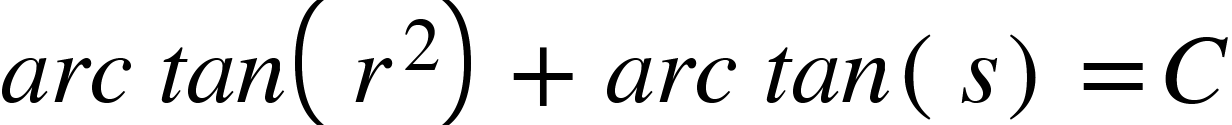
This is a separable equation.

Separating variable and we get,

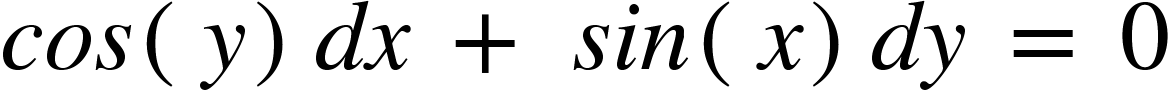


Integrating it and we get,



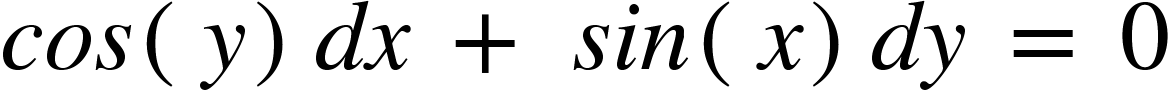


Where C is the arbitrary constant which is the required general solution.



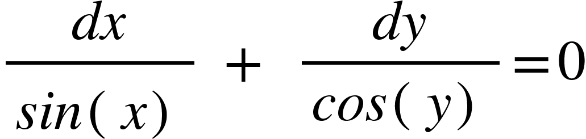
**4.{"mathml":"<math xmlns=\"http://www.w3.org/1998/Math/MathML\" style=\"font-family:stix;font-size:16px;\"/>","origin":"MathType for Microsoft Add-in"}**

**Solution:**

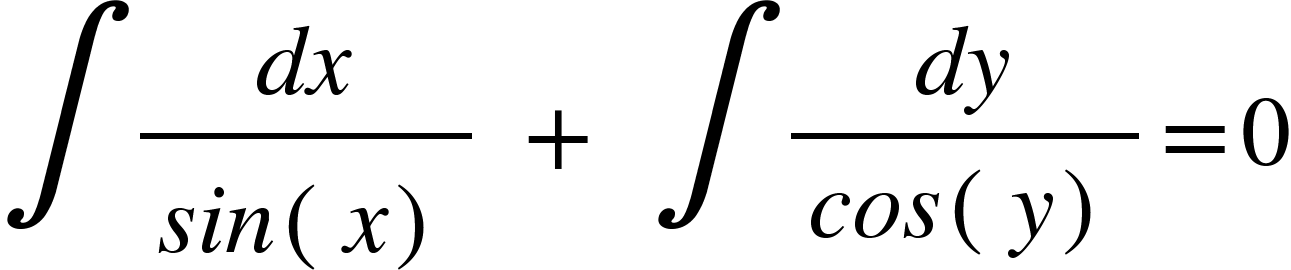


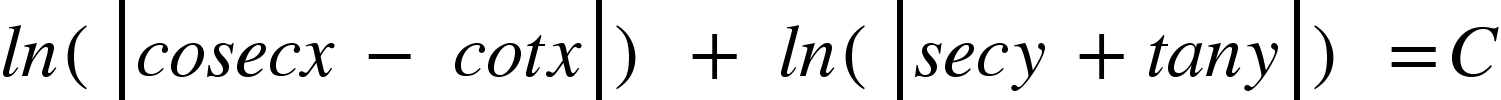
This is a separable equation.

Separating variable and we get,

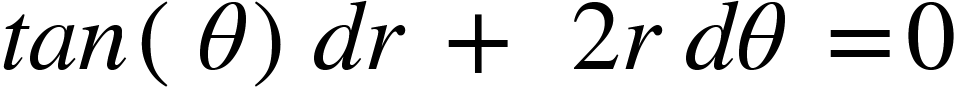


Integrating it and we get,



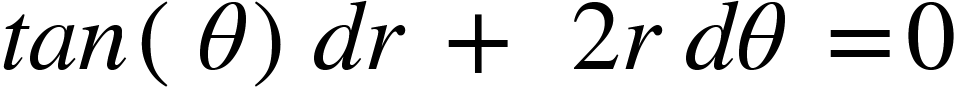


where C is the arbitrary constant which is the required general solution.



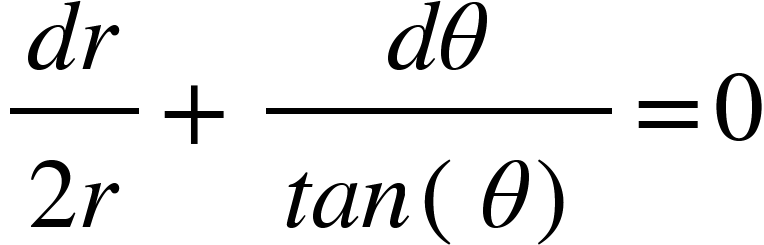
5.

**Solution:**

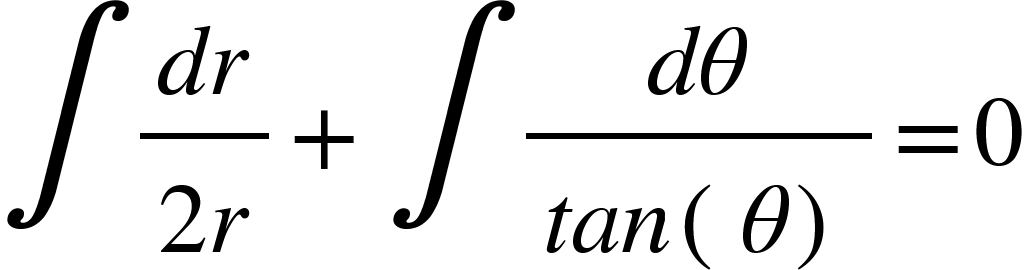


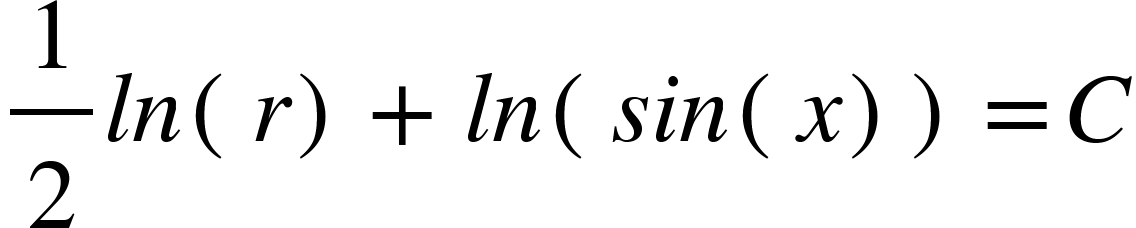
This is a separable equation.

Separating variable and we get,

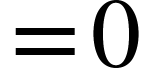
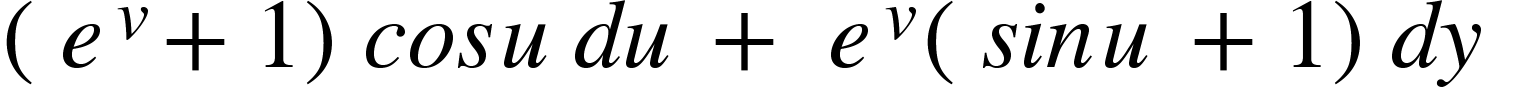


Integrating it and we get,



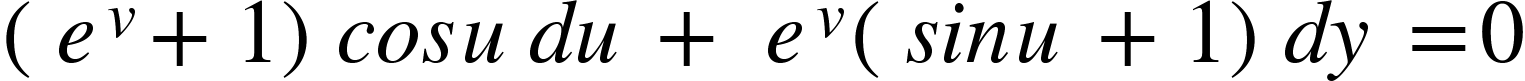


where C is the arbitrary constant which is the required general solution.



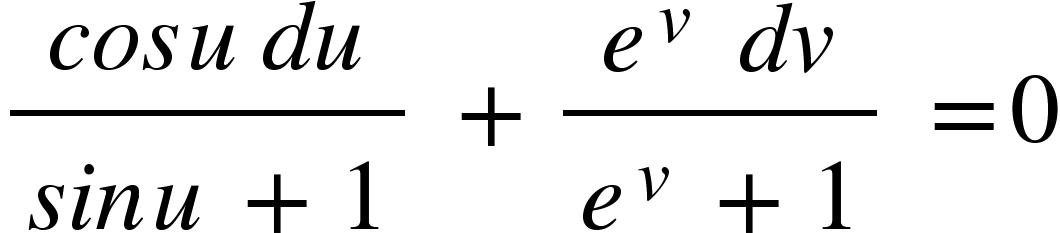
6.

**Solution:**

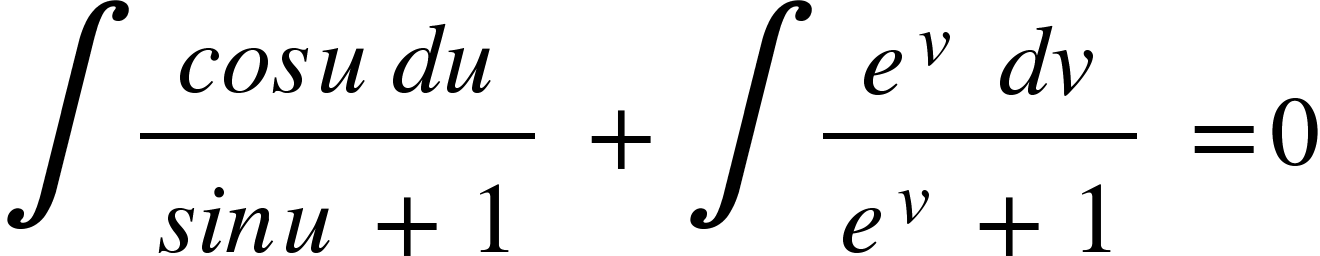


This is a separable equation.

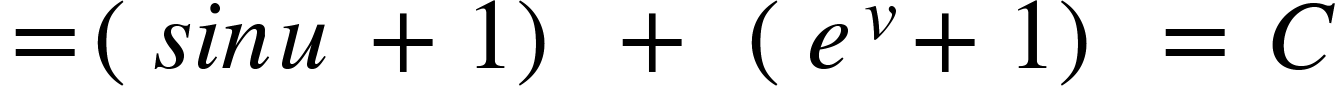
Separating variable and we get,

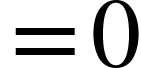
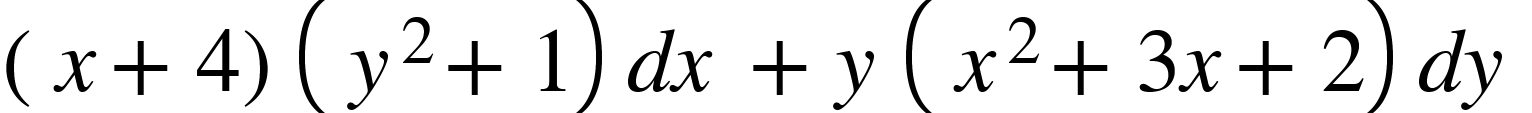


Integrating it and we get,



{"mathml":"<mml:math style=\"font-family:stix;font-size:16px;\" xmlns:m=\"http://schemas.openxmlformats.org/officeDocument/2006/math\" xmlns:mml=\"http://www.w3.org/1998/Math/MathML\"><mml:mstyle mathsize=\"16px\"><mml:mo>=</mml:mo><mml:mi mathvariant=\"italic\">ln</mml:mi><mml:mo>&#x2061;</mml:mo><mml:mfenced separators=\"|\"><mml:mrow><mml:mi mathvariant=\"italic\">sin</mml:mi><mml:mo>&#x2061;</mml:mo><mml:mi>u</mml:mi><mml:mo>+</mml:mo><mml:mn>1</mml:mn></mml:mrow></mml:mfenced><mml:mi>&#xA0;</mml:mi><mml:mo>+</mml:mo><mml:mi>&#xA0;</mml:mi><mml:mi mathvariant=\"italic\">ln</mml:mi><mml:mo>&#x2061;</mml:mo><mml:mfenced separators=\"|\"><mml:mrow><mml:msup><mml:mi>e</mml:mi><mml:mi>v</mml:mi></mml:msup><mml:mo>+</mml:mo><mml:mn>1</mml:mn></mml:mrow></mml:mfenced><mml:mi>&#xA0;</mml:mi><mml:mo>=</mml:mo><mml:mi>&#xA0;</mml:mi><mml:mi mathvariant=\"italic\">ln</mml:mi><mml:mo>&#x2061;</mml:mo><mml:mi>C</mml:mi></mml:mstyle></mml:math>","origin":"MathType Legacy","version":"v3.18.2"}

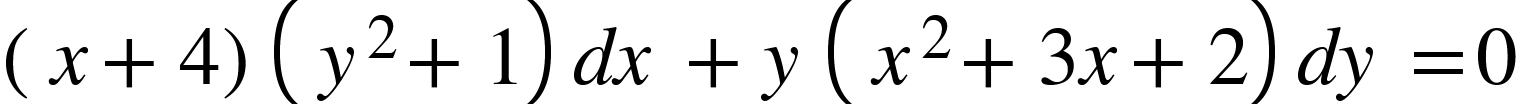




where C is the arbitrary constant which is the required general solution.

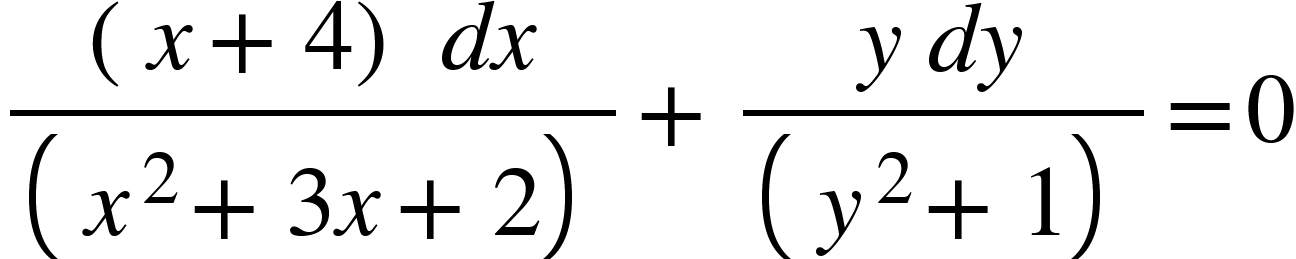
7.

**Solution:**

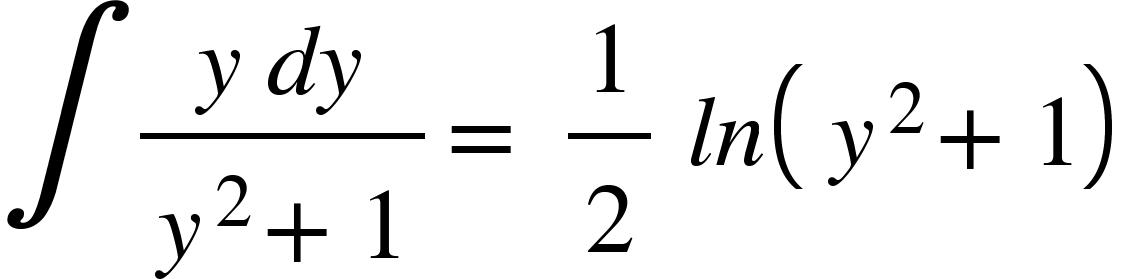


This is a separable equation.

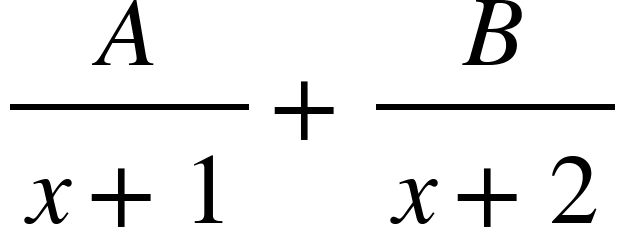
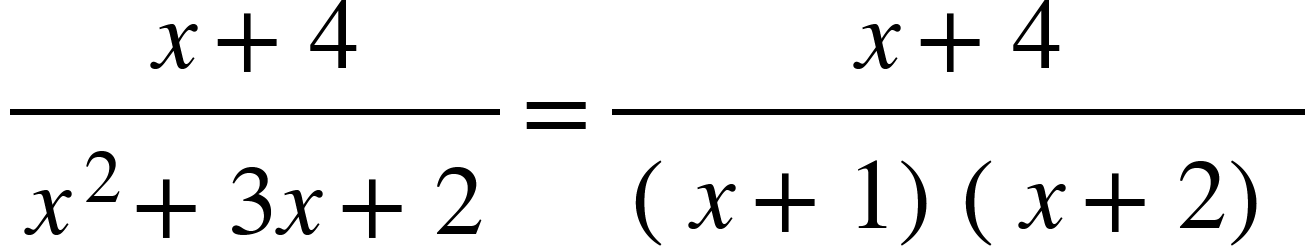
Separating variable and we get,

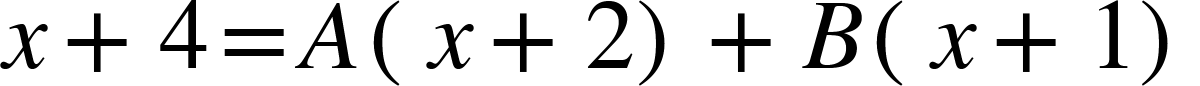


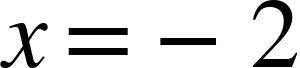
next we integrate,

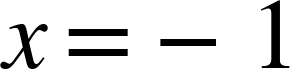


To integrate the dx term, we use the fractions. we get,

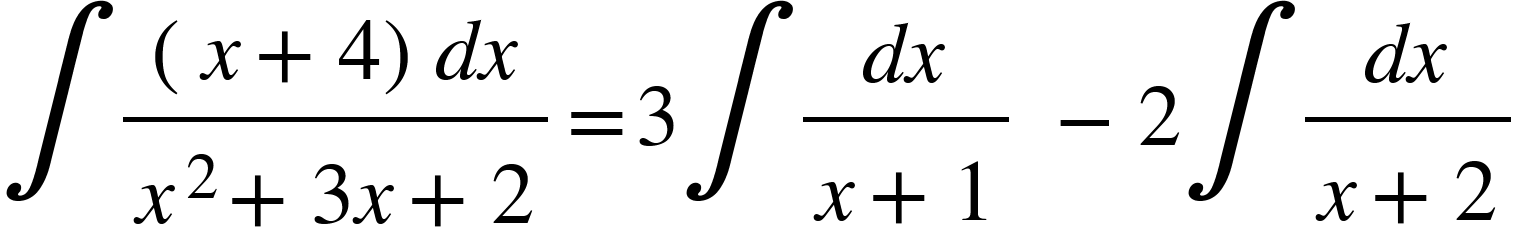


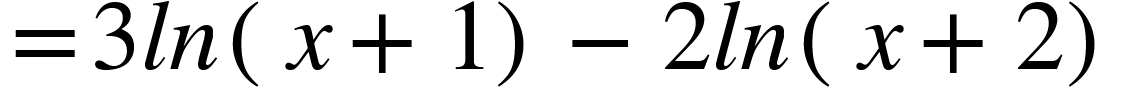


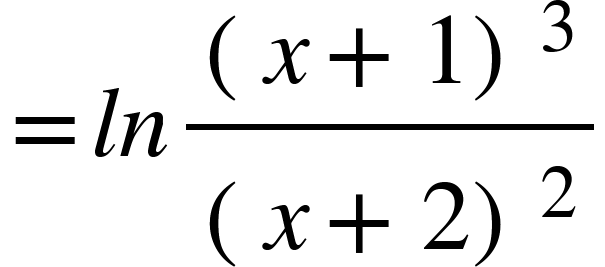




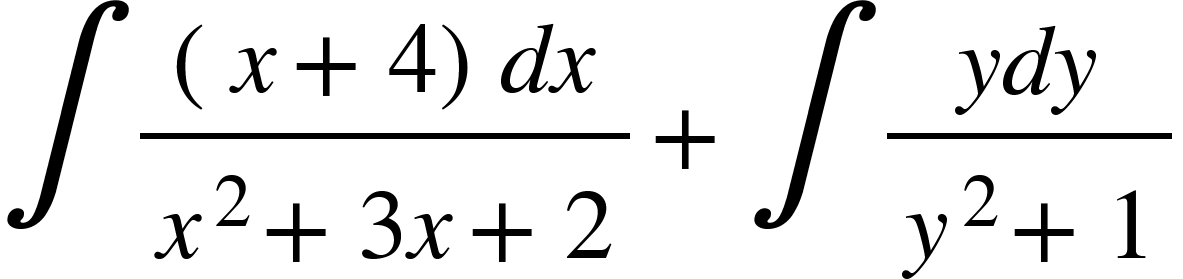
then gives A=3 and gives B=-2

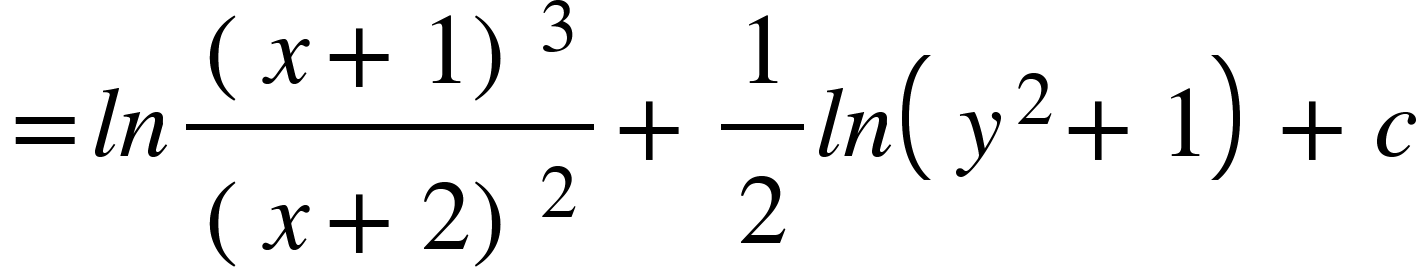






Now,





where C is the arbitrary constant which is the required general solution.

{"mathml":"<math xmlns=\"http://www.w3.org/1998/Math/MathML\" style=\"font-family:stix;font-size:16px;\"/>","origin":"MathType for Microsoft Add-in"}