 Case 3:

1. Solve the differential equation given when

| Worked solution | Explanation |
| --- | --- |
|  | Separate the *x* and *y* variables through multiplicative methods only. |
|  | Integrate both sides using the conditions given. |
|  | Balance the integral to form an integral in the form . |
|  | Evaluate the integral. |
|  |  |
|   |  |
|   |  |
|   | Simplify and rearrange to make *y* the subject of the equation. |
|   |  |
|  |  |
|  | Determine the function by substituting the values and into the positive and negative functions and testing which holds true. |

1. Solve the differential equation where when

| Worked solution | Explanation |
| --- | --- |
|  | Split the exponent using the multiplicative index law |
|   | Separate the *x* and *y* variables through multiplicative methods only |
|  | Integrate both sides using the conditions given |
|   | Evaluate the integral. |
|  | Evaluate the integral. |
|  | Evaluate the integral. |
|  | Evaluate the integral. |
|  | Simplify.  |
|  | Rearrange to make *y* the subject of the equation. |