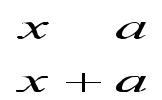
**MTH401 Assignment 1 Solution Spring 2022**

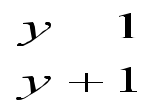
**Vudaily.com**

**Question No 1 Solution:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *dy* | | | = | (1 + *e*− *x* )( *y* 2 − 1) | | | | | | | | | | | |  |
|  |  |  |  |  |
|  | *dx* | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 | | | | |  | *dy* = | | (1 + *e*− *x* )*dx* | | | | | | | | |  |
|  |  |  |  |  |  |  |
|  | *y* 2 − 1 | | | | | | |  | |  |  |  |  |  |  |  |  |
| 1 | | | | |  | *dy* = | | *dx* + | | | | *e*− *x dx* | | | | |  |
|  |  |  |  |  |  |  |
|  |  | |  | | |  |  |  | |  | |  |  |  |  |  |  |
|  | *y* 2 − 1 | | |  |  |  |  |  |  |
|  | *Here* | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  | 1*dx* = 1 | | | | | | ln | |  |  |  |  | + *c* |  |
|  | | | | | | | |  |  |  |  |  |  |  |  |  |  |
|  | | *x*2 − *a*2 | | | | |  |  | 2*a* |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

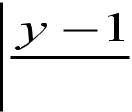


|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *so*, | |  |  |  |  |  |  |  |  |
| 1 | ln |  |  |  |  | = *x* + | *e*− *x* | + *c* |  |
|  |  |  |  |  |
|  |  |  |  |  |
| 2 |  |  |  |  | −1 |  |
|  |  |  |  |  |  |  |  |



1. ln *y* − 1 = *x* − *e*− *x* + *c*
2. *y* + 1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | *y* − 1 | = 2( *x* − *e*− *x* + *c* |  |
| ln |  |  |
|  |  |
|  |  | *y* + 1 | |  |

*e*ln  = *e*2 ( *x* − *e*− *x* + *c*)



 = *e*2 ( *x* − *e*− *x* + *c*)



1. − 1 = *e*2( *x* −*e*− *x* ) .*ec* ( *y* + 1)

*y* − 1 = *cye*2 ( *x* − *e*− *x* ) + *ce*2( *x*−*e*−*x* + *ce*2( *x* −*e*− *x* )

)

1. − *cye*2( *x* −*e*− *x* ) + *ce*2( *x* −*e*− *x* )

*y*− *cye*2( *x* −*e*− *x* ) = 1 + *cs*2( *x* −*e*− *x* )

*y*(1 − *ce*2( *x* −*e*− *x* ) = 1 + *ce*2( *x* −*e*− *x* )

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  | 1 |  | |  |
| *y* = | 1 + *ce*2( *x* −*e*− *x* ) | | |  |
|  | − *x* | |  |

1 − *ce*2( *x* −*e* )

**Question No 2 Solution:**

1

2 *ydx* + (*x* − sin *y* 2 )*dy* = 0

*sohere*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | 1 | |  |  |
|  | |  | | |  |  |  |
| *M* = 2 *y* | | , *N* = (*x* + sin *y* 2 ) | | | | |  |
| *M* | = 2 | , | *N* | = 1 | | |  |
|  |  |
|  |  |  |
| *y* |  |  | *x* |  |

*The givendifferential equationis not a exact differential equation*.*because*

*M* *N*

*y* *x*

*Now find the* int

* *N*

*u* = *e y M x dyM*

1. = *e* 21*y*− 2*dy*

−1

*u* = *e*2 *dy*

−1 1 *dy*

*u* = *e* 2 *y*

−1 ln *y*

*u* = *e* 2

−1

1. = *e*ln *y* 2

−1

*u* = *y* 2

*Now multiply* int *egrating factor with the given differential equation*.

−1 −1 −1 1

2 *y* 2 *ydx* + ( *y* 2 *x* + *y* 2 sin *y* 2 )*dy* = 0

−1 −1 −1 1

2 *y* 2 *dx* + ( *y* 2 *x* + *y* 2 sin *y* 2 )*dy* = 0

*Which is exact differential equation*