**King Saud University**

**College of Sciences**

**Department of Mathematics**

**Math 111**

**Final exam**

**Second semester, 1430-1431H**

**Time 3 Hours**

|  |  |
| --- | --- |
| **Name:** | **Student No.:** |
| **Section No.:** | **Sequence No.:** |
|  |
| **Question No.** | **I** | **II** | **III** | **IV** |  | **BONUS** | **Total** |
| **Mark** |  |  |  |  |  |  |  |
| **QUESTION I****Choose the correct answer** |
| 1. The value of x that satisfies the equation  is equal to: |
| i.  | Ii. 1 | iii.  | iv. None of the previous. |
|  |
| 2. Given that , then  is equal to: |
| i. 1 | ii. 2 | iii. . | iv. None of the previous. |
|  |
| 3.  is equal to: |
| i. . | ii. . | iii..  | iv. None of the previous. |
|  |
| 4. The integral  is equal to; |
| i. 1. | ii.  | iii. | iv. None of the previous. |
|  |
| 5. The partial fraction of  is equal to: |
| i. . | ii. . | iii..  | iv. None of the previous. |
|  |
| 6. If  then is equal to: |
| i. . | ii. . | iii. . | iv. None of the previous. |
|  |
| 7. A parametric equation of a line segment joining the points and is |
| i. . | ii.  | iii.  | iv. None of the previous. |
|  |
| 8. The rectangular equation corresponding to the polar equation  is: |
| i. . | ii. . | iii. . | iv. None of the previous. |
|  |
| 9. A polar coordinate representation of the rectangular point  is: |
| i. . | ii.  | iii.  | iv. None of the previous. |
|  |
| 10. The rectangular equation corresponding to the polar equation  is |
| i.  | ii.  | iii.  | iv. None of the previous. |
| **QUESTION II** |
| 1.a. Draw the following functions then shade in the area bounded by them **(DO NOT INTEGRATE)**: |
|  |
| 1.b. Calculate the area between the functions in part (a). |
|  |
| 2. Find the volume of the solid formed by revolving the region bounded by the equations 1) about the **x-axis**2) about the **y-axis** |
| **QUESTION III** |
| 1. Find a polar equation corresponding to the rectangular equation. |
|  |
| 2. Sketch the graph of the polar equation. |
|  |
| 3. Find the area of the region of from  to . |
| **Question IV****Evaluate the following integrals if it exists** |
| 1. . |
|  |
| 2. . |
|  |
| 3. . |
|  |
| 4. . |
|  |
| 5. Find the arc length of  from  to . |
| **BONUS QUESTION** |
| Determine whether the following integral converges or diverges. Find the value of the integral if it converges. |

 Good Luck