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| **Name:**  **Sequence Number:**  **Teacher's Name:**  **Section:**  **Only simple calculator is allowed.** |

***Note*: *The exam consists of 10 pages***

|  |  |
| --- | --- |
| **Question** | **Mark** |
| **Question I** |  |
| **Question II** |  |
| **Question III** |  |
| **Question IV** |  |
| **Question V** |  |
| **Total** |  |

**Question I:**

Choose the correct answer, then fill in the table below:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Question | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Answer |  |  |  |  |  |  |  |  |  |  |

(1) is equal to

(a) (b) (c) 0 (d) None of the previous

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(2) If the polar coordinates of a point are then its rectangular coordinates are

(a)  (b) (c) (d) None of the previous

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(3) If  then  is equal to

(a) (b)

(c) (d) None of the previous

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(4) is equal to

(a) (b) (c) 0 (d) None of the previous

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(5) If then

(a) (b) (c) None of the previous

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(6) The number satisfying the Mean Value Theorem for is

(a) (b) (c) (d) None of the previous

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(7) The best substitution to evaluate is

(a) (b) (c) (d) None of the previous

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(8) If the rectangular coordinates of a point are then its polar coordinates are

(a) (b) (c) (d) None of the previous

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(9) If  then

(a) (b) (c) (d) None of the previous

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(10) The graph of the polar equation represents

(a) a circle (b) a line (c) a rose (d) None of the previous

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**Question II:**

**A.** Sketch the region R bounded by the graphs of the functions

Then **find its area.**

**B.** Find the arc length of the graph of

**C**. If , is revolved about the , then find the area of the resulting surface.

**D.** Let R be the region bounded by the graphs of in the first quadrant. Then answer the following:

(1) Sketch the region R.

(2) Find the volume of the solid generated by revolving R about the

(3) Find the volume of the solid generated by revolving R about the

**Question III:**

Evaluate the following integrals:

1.

2.

3.

4.

5**.**

**Question IV:**

Determine whether the improper integral converges or diverges. Then find the value of the improper integral if it converges.

1.

2.

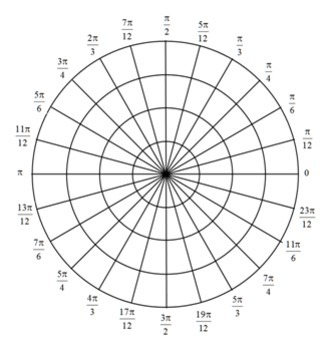
**Question V:**

**A.** Sketch the graph of the parametrized curve  
and indicate the orientation.

**B.** Find a polar equation that has the same graph as the equation

**C.** Find an equation in that has the same graph as the polar equation

**D.** (1) Sketch the graph of the polar equation



(2) Find the area of the region R inside the graph in part (1).

Good Luck ☺