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t

(3) [6 pts] Find a convergence.

Solution (I)

center "0": -

(2)

Solution (II)

center "3": -1

(Both solutions

(4) [5 pts] Show the

$$f'(x) = \frac{-x}{\sqrt{x^2}}$$

$$\Rightarrow K = \frac{1}{\sqrt{x}}$$

(It is a (

(5) [5 pts]

say a

$$\vec{r}'(t) =$$

$$S = \int^t$$

→ arct

$$\Rightarrow \vec{r} = \vec{r}$$

$$= (C)$$

(6) [5 pts]

Since  $\| \cdot \|$ from: Thm[Proof:

$$\Rightarrow \vec{r}$$

$$\Rightarrow \cancel{2\vec{r}}$$

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$$\left(-\frac{1}{2} \leq \right)$$

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$$\textcircled{1} \begin{cases} 2x \\ 2y \\ 2z \end{cases}$$

(N.B.  $x$ the  $y$  $x$  $\Rightarrow$ 

(1

 $=$  $=$  $=$ 

(1



(15) [5 P]

$$\begin{aligned} & \iint_D x^2 \\ &= \int_{-\pi/2}^{\pi/2} \int_0^1 r^2 \cos^2 \theta \, r \, dr \, d\theta \\ &= \int_{-\pi/2}^{\pi/2} \left( \frac{1}{4} \sin 2\theta \right) d\theta \end{aligned}$$

(16) [5 P]

$$\begin{aligned} & \iint_D \frac{y}{1+x^2} \\ &= \int_0^1 \int_{-1}^1 \frac{y}{1+x^2} \, dx \, dy \\ &= \frac{1}{2} \int_0^1 \left( \frac{1}{1+x^2} \right) dy \end{aligned}$$

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(a)