微積分乙(下)第二次期中考

2018/05/08

超過 100 分，以 100 分計。

9-2 15

1. 10% Let A be the region bounded by $f(x)=x^2$, $y=0$, $x=1$, and $x=5$. Find the volume of the solid of revolution formed by rotating A about the x-axis.

9-3 19

e的積分

2. 10% A money market fund has a continuous flow of money ar a rate of $f(t)=1500-60t^2$, reaching 0 in 5 years. Find the present value of this flow if interest is 5% compounded continuously.

9-4 35

3. 5% Determine whether the imporper integral $\int_{-\infty}^{\infty} xe^{-x^2}dx$ converges or diverges, and find the value if the intergal converges.

類 9-4 36

4. 5% Determine whether the imporper integral $\int_{-\infty}^{\infty} \frac{x}{1+x^2}dx$ converges or diverges, and find the value if the intergal converges.

10-2 48

5. 10% Suppose the production function of a company is given by $p(x,y)=250\sqrt{x^2+y^2}$ where x represents units of labor and y represents units of capital. Find (a) The marginal productivity of labor and (b) The marginal productivity of capital when 6 units of labor and 8 units of capital are used.

(a) 150 (b) 200

10-3 15

6. 10% Let $f(x,y)=x^2+4y^3-6xy-1$. Find all points where $f(x,y)$ has any ralative extrema and any saddle points.

10-4 12

7. 10% Find positive numbers x and y such that $x+y=48$ and $5x^2y+10$ is maximized.

8. 10% Find the maximum value of $f(x,y,z)=x^2yz+1$ on the intersection of the plane $z=1$ with the sphere $x^2+y^2+z^2=10$.

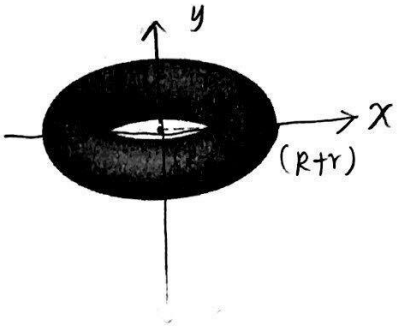
10-5 8

9. 10% Use the total differential to approximate $\sqrt{4.96^2+12.06^2}$.

10-6 14

10. 20% Find (a) $\int_0^3 \int_4^5 x\sqrt{x^2+3y}\,dy\,dx$ and ~~(b)~~ $\int_0^8 \int_{x/2}^4 \sqrt{y^2+4}\,dy\,dx$.

~~11~~. 10% Find the volume of a solid torus (the donut-shaped solid shown in the figure) with radii r and R.



附表:

$\pi = 3.14159265$

$e = 2.718282$

$e^{0.05} = 1.051271$

$e^{0.1} = 1.105171$

$e^{0.15} = 1.161834$

$e^{0.20} = 1.221403$

$e^{0.25} = 1.284025$