أسئلة سنوات

فاينل

لجنة سنافر البوليتكنك - بسواعدنا نبنيها

اسم المادة

التفاضل والتكامل 101

بسواعدنا نبنيها

تواصل معنا

www.Muslimengineer.net

snafer.muslimengineer.info

/groups/Smurfs.On.The.Way

Muslimengineerpage

Name: ______________________ Class: __________________ Date: _________ ID: B

math1,final

____ 1. The series $\sum_{k=1}^{\infty}\left(\sqrt{k+2}-\sqrt{k}\right)$

a. has a sum $=\sqrt{2}$ b. has a sum $=-1$ c. diverges d. has a sum $=\sqrt{3}$

____ 2. The second none-zero term of the Maclaurin series expansion of $f(x)=x^2\cos(x^2)$ is

a. $\frac{1}{24}x^6$ b. $-\frac{1}{2}x^6$ c. $\frac{1}{2}x^6$ d. $-\frac{1}{24}x^6$

____ 3. One of the following series is absolutely convergent

a. $\sum_{k=1}^{\infty}\frac{(-1)^k}{k+5}$ b. $\sum_{k=1}^{\infty}\frac{(-1)^k}{\sqrt[3]{k^5}}$ c. $\sum_{k=1}^{\infty}\frac{(-1)^k}{\sqrt[5]{k^3}}$ d. $\sum_{k=1}^{\infty}\frac{(-1)^k}{\sqrt[5]{k+1}}$

____ 4. If n is an integer then $\int_0^{\frac{\pi}{2}}\cos(2nx)\,dx=$

a. $2n$ b. 1 c. 0 d. $\frac{1}{2n}$

____ 5. The sequence $\left\{(-1)^n\frac{n}{n+1}\right\}_{n=1}^{\infty}$

a. converges to 0 b. converges to -1 c. diverges d. converges to 1

____ 6. The equation of the plane that passes through the origin and normal (perpendicular) to the line

$L:\ \frac{x-1}{2}=y=-z$

a. $2x-y+z=0$
b. $2x+y+z=0$
c. $2x+y-z=0$
d. $2x+y=0$

____ 7. Given that $\int_1^3 x^2 f(x^3)\,dx=5$ then $\int_1^{27} f(x)\,dx=$

a. 5 b. 15 c. 20 d. $\frac{5}{3}$

____ 8. If $y=4$ *and* $x=8$ are horizontal and vertical asymptotes of $f(x)=\frac{bx+1}{2x-a}$ then the ordered pair $(a,b)=$

a. (8, 16) b. (8, 4) c. (4, 8) d. (16, 8)

____ 9. The equation of the plane that passes through the point $(4,5,6)$ and parallel to the xz-plane is :

a. x = 4 b. z = 6 c. x + y + z = 15 d. y = 5

____ 10. If u_k and v_k are positive for any $k = 1, 2, 3, \ldots$ such that $\lim\limits_{k\to\infty}(k\,u_k) = 8$ and $\lim\limits_{k\to\infty}\left(k^2\,v_k\right) = 7$.

A : $\sum\limits_{k=1}^{\infty} u_k$, B : $\sum\limits_{k=1}^{\infty} v_k$ then

a. A is convergent but B is divergent
b. both A and B are divergent
c. B is convergent but A is divergent
d. both A and B are convergent

____ 11. $\int_{-a}^{a} \sqrt{a^2 - x^2}\, dx =$

a. $\frac{1}{2}\pi a^2$ b. $\frac{1}{4}\pi a^2$ c. πa^2 d. $\frac{1}{3}\pi a^2$

____ 12. The sequence $\left\{\left(\frac{n+3}{n+1}\right)^n\right\}_{n=1}^{\infty}$

a. diverges b. converges to e^3 c. converges to e^2 d. converges to 3

____ 13. If $\vec{a} = \langle 0, -1, 1\rangle$ and $\vec{b} = \langle 1, 1, -1\rangle$ then $\left\|\vec{a}\times\vec{b}\right\| =$

a. $\sqrt{2}$ b. 3 c. $\sqrt{6}$ d. 2

____ 14. If $f(x) = x\ln x$ then $f'(e^{a-1}) =$

a. 0 b. 1 c. a d. a^2

____ 15. The interval of convergence of $\sum\limits_{k=1}^{\infty}(-1)^k \frac{x^k}{\sqrt{k}}$ is

a. $(-1, 1]$ b. $(-1, 1)$ c. $[-1, 1]$ d. $[-1, 1)$

____ 16. The vector equation of the line that passes through the points $P(0, 1, -1)$ and $Q(3, 7, -4)$ is

a. $\vec{r} = \langle 0, 1, -1\rangle + t\langle 3, 7, -4\rangle \quad t\in\mathbb{R}$
b. $\vec{r} = \langle 1, 2, -1\rangle + t\langle 0, 1, -1\rangle \quad t\in\mathbb{R}$
c. $\vec{r} = \langle 1, 2, -1\rangle + t\langle 3, 7, -4\rangle \quad t\in\mathbb{R}$
d. $\vec{r} = \langle 0, 1, -1\rangle + t\langle 1, 2, -1\rangle \quad t\in\mathbb{R}$

____ 17. If $y = e^{ax}$ satisfies the equation $y'' - 6y' + 9y = 0$ then $a =$

a. 2 b. 1 c. 3 d. 4

____ 18. Given that $\sum\limits_{k=1}^{\infty} a_k = \sum\limits_{k=1}^{\infty} \frac{k!}{k^k}$, $\rho = \lim\limits_{k\to\infty}\left(\frac{a_{k+1}}{a_k}\right)$ then $\rho =$

a. e b. 0 c. 1 d. e^{-1}

لجنة سنافر البوليتكنك ~ الاتجاه الإسلامي

___ 19. The length of the curve $y = e^{x} - e^{-x}$, $0 \le x \le 1$ is given by

a. $\int_0^1 \sqrt{e^{2x} + e^{-2x} + 1}\, dx$

c. $\int_0^1 \sqrt{e^{2x} + e^{-2x}}\, dx$

b. $\int_0^1 \sqrt{e^{2x} + e^{-2x} - 1}\, dx$

d. $\int_0^1 \sqrt{e^{2x} + e^{-2x} + 3}\, dx$

___ 20. $\int_0^5 \frac{\sqrt[3]{x}}{\sqrt[3]{x} + \sqrt[3]{5-x}}\, dx$

a. $\int_0^5 \frac{dx}{\sqrt[3]{x} + \sqrt[3]{5-x}}$

c. $-\int_0^5 \frac{\sqrt[3]{x}}{\sqrt[3]{x} + \sqrt[3]{5-x}}\, dx$

b. $\int_0^5 \frac{\sqrt[3]{5-x}}{\sqrt[3]{x} + \sqrt[3]{5-x}}\, dx$

d. $-\int_0^5 \frac{dx}{\sqrt[3]{x} + \sqrt[3]{5-x}}$

___ 21. $\int \cos^{-1}(x)\, dx$

a. $x\cos^{-1}(x) + \int \frac{x}{\sqrt{1-x^2}}\, dx$

c. $x\cos^{-1}(x) - \int \frac{x}{\sqrt{1-x^2}}\, dx$

b. $-x\cos^{-1}(x) + \int \frac{x}{\sqrt{1-x^2}}\, dx$

d. $-x\cos^{-1}(x) - \int \frac{x}{\sqrt{1-x^2}}\, dx$

___ 22. The function that is continuous but not differentiable at $x = 1$ is

a. $f(x) = \frac{1}{x-1}$ b. $f(x) = |x|$ c. $f(x) = \sqrt[5]{(x-1)^4}$ d. $f(x) = x^2 - 1$

___ 23. The radius of convergence of $\sum_{k=0}^{\infty} (-1)^k \frac{x^{2k}}{(2k)!}$ equals

a. 2 b. $\frac{1}{2}$ c. 1 d. ∞

___ 24. One of the following series is conditionally convergent

a. $\sum_{k=1}^{\infty} \frac{(-1)^k}{2 + \ln k}$ b. $\sum_{k=1}^{\infty} (-1)^k \left(\frac{1}{4}\right)^k$ c. $\sum_{k=1}^{\infty} \frac{(-1)^{k+1}}{4}$ d. $\sum_{k=1}^{\infty} \frac{(-1)^k}{k^3}$

___ 25. Given that $\vec{a} = \langle 3,0,4 \rangle$, $\vec{b}$ is a vector in the direction of $\vec{a}$ such that $\|\vec{b}\| = 3$ and $\vec{c} = \langle 2,7,1 \rangle$ then $\vec{b}.\vec{c} =$

a. -5 b. 6 c. 5 d. -6