Toshkent davlat iqtisodiyot universiteti Samarqand filiali 1-bosqich talabalari uchun "Matematika II" fanidan nazorat savollari

Ishchi mavzu (auditoriya dars mavzulari) yuzasidan savollar:

1. Aniq integral va uning xossalari (aniq integral, aniq integralning xossalari)

2. Aniq integralning geometrik manosi *(Aniq integralning geometrik manosi)*

3. Aniq integralda o'zgaruvchilarni almashtirib hisoblash *(o'zgaruvchilarni almashtirib integrallash)*

4. Integral hisobning asosiy teoremasi (*Integral hisobning asosiy teoremasi, Nyuton-Leybnits teoremasi)*

5. Aniq integralni bo'laklab integrallash *(bo'laklab integrallash, teorema)*

6. Birinchi tur xosmas integrallar *(xosmas integrallar, Birinchi tur xosmas integrallar, teorema*

7. Ikkinchi tur xosmas integrallar *(Ikkinchi tur xosmas integrallar xaqidagi teorema)*

8. Ikkinchi tur xosmas integrallarning yaqinlashish alomati *(ikkinchi tur xosmas integrallar, teoremalar)*

9. Qatorlarni yaqinlashishga tekshirishda taqqoslash alomati *(taqqoslash alomati, teorema)*

10. Qatorlarni yaqinlashishga tekshirishda Dalamber alomati *(Dalamber alomati)*

11. Uzoqlashuvchi sonli qatorlar *(Uzoqlashuvchi sonli qatorlar)*

12. Qatorlarni yaqinlashishga tekshirishda Koshining ildiz alomati *(Koshining ildiz alomati)*

13. Qatorlarni yaqinlashishga tekshirishda Koshining integral alomati *(sonli qatorlar, Koshining integral alomati)*

14. Darajali qatorlar va ularning yaqinlashishi (Darajali qaror ta'rifi, yaqinlashish radiusi va sohasi)

15. Funksional qatorlarni yaqinlashishga tekshirishda Abel teoremasi *(yaqinlashish radiusi, yaqinlashish sohasi)*

16. Differensial tenglamalar deb nimaga aytiladi *(differensial tenglamalar, birinchi, ikkinchi tartibli differensial tenglamalar)*

17. O'zgaruvchilari ajraladigan differensial tenglamalar *(O'zgaruvchilari ajraladigan differensial tenglamalar)*

18. Birinchi tartibli chiziqli differensial tenglama va uning yechimini topish formulasi.

19. Bernulli tenglamasi va uni yechish.

20. To'liq differensialli tenglama va uni yechish.

21. Hosilaga nisbatan yechilgan bir jinsli differensial tenglamalar va ularni yechish

Misollar:

22. $\int_0^{\frac{\pi}{4}} tgx \cdot lncosx dx$ integralni hisoblang.

23. $\int_1^e \frac{(lnx)^2}{x} dx$ integralni hisoblang

24. $\int_{e+1}^{e^2+1} \frac{1+\ln(x-1)}{x-1} dx$ integralni hisoblang

25. $\int_0^{\frac{\pi}{6}} cos^3 x \sqrt{sinx} dx$ integralni hisoblang

26. $\int_1^3 x \sqrt{(1+2x)} dx$ integralni hisoblang.

27. $\int_3^6 \sqrt{1+2x} dx$ integralni hisoblang.

28. $\int_0^1 \frac{xdx}{x^4+1}$ integralni hisoblang

29. $\int_0^1 x^2 e^{-2x^3} dx$ integralni hisoblang

30. $\int_0^{+\infty} \frac{dx}{1+x^2}$ xosmas integralni yaqinlashishga tekshiring.

31. $\int_0^{+\infty} \frac{lnx}{x} dx$ integralni hisoblang va yaqinlashuvchi yoki uzoqlashuvchi ekanligini ko'rsating

32. $\int_0^{+\infty} \frac{x^3+1}{x^4} dx$ integralni yaqinlashishga tekshiring

33. Qatorlarni yaqinlashishga Dalamber alomati bilan tekshiring: $\sum_{n=1}^{\infty} \frac{n^n}{n!}$

34. O'zgarmas koeffitsientli differensial tenglamani yeching: $y'' - 4y' - 12y = 2x - 4$

35. Qatorni yaqinlashishga tekshiring va yig'indisini toping. $\sum_{n=1}^{\infty} \frac{1}{9n^2+3n-2}$

36. Qatorni yaqinlashishga tekshiring va yig'indisini toping. $\sum_{n=1}^{\infty} \frac{1}{4n^2+4n-3}$

37. Qatorlarni yaqinlashishga tekshiring: $\sum_{n=1}^{\infty} \left(\frac{4n-1}{4n}\right)^{n^2}$

38. Darajali qatorni yaqinlashish radiusi va yaqinlashish oralig'ini toping: $\sum_{n=1}^{\infty} \frac{1}{5^n} x^n$

39. $(1+x^2)$dy+$(1+y^2)$dx=0 defferensial tenglamani yeching.

40. Bir jinsli differensial tenglamani yeching. $\left(y - \sqrt{x^2+y^2}\right)dx - xdy = 0$

41. Bir jinsli differensial tenglamani yeching. $(x^2 + xy + y^2)dx - x^2dy = 0$

42. $(3x^2 + 6y^2)dx + (6x^2y + 4y^3)dy = 0$. to'liq defferensial tenglamani yeching.

43. $y^{IV} - 4y^{III} + 3y^{II} = 0$ differensial tenglamani yeching.

44. O'zgarmas koeffitsientli differensial tenglamani yeching:

$y'' + 10y' + 9y = 3x - 4$

45. O'zgarmas koeffitsientli differensial tenglamani yeching:

$y'' + 5y' + 4y = 7x + 1.$

Mustaqil ta'lim mavzulari yuzasidan savollar:

1. Aniq integral yordamida aylana uzunligini hisoblash formulasini keltirib chiqaring
2. Ikki o'zgaruvchili funksiya va uning xossalari (Ikki o'zgaruvchili funksiya ta'rifi, aniqlanish va qiymatlar sohasi)
3. Ikki o'zgaruvchili funksiyaning limiti va uzluksizligi (Ikki o'zgaruvchili funksiya, limit, uzluksizlik)
4. Ikki o'zgaruvchili funksiyaning xususiy hosilalari *(hosila, xususiy hosila)*
5. Ikki o'zgaruvchili funksiyaning aralash hosilalari *(hosila, aralash hosila)*
6. Ishora almashuvchi qatorlar va ularning yaqinlashuvchanligi.
7. Qator yaqinlashishining zaruriy va yetarli alomati *(sonli qatorlar, Koshi kriteriyasi)*
8. Yaqinlashuvchi sonli qatorlar *(sonli qatorlar, yaqinlashuvchi sonli qatorlar, yaqinlashuvchi sonli qatorlarning yig'indisi)*

9. Hosilaga nisbatan yechilgan bir jinsli differensial tenglamalar va ularni yechish.

10. O'zgaruvchilari ajraladigan differensial tenglamalar va ularni o'zgaruvchilari ajralgan differensial tenglamalarga keltirish.

11. Ikkinchi tartibli chiziqli bir jinsli o'zgarmas koeffitsiyentli differensial tenglamalar.

12. Bir jinsli differensial tenglamalar *(bir jinsli funksiya, bir jinsli differensial tenglama)*

13. Yuqori tartibli chiziqli bir jinsli o'zgarmas koeffitsiyentli differensial tenglamalar.

14. Ehtimollarni ko'paytirish teoremasi *(ehtimollarni ko'paytirish teoremalari)*

15. Ehtimolning statistik va geometrik ta'riflari *(ehtimolning statistik va geometrik ta'rifi)*

16. Hodisalarning yig'indisi va ko'paytmasi.

17. Bernulli sxemasi. Bernulli formulasi *(Bernulli sxemasi, Bernulli teoremasi).*

18. Uzluksiz tasodifiy miqdorlar *(xossalari, tasodifiy miqdorlar, matematik kutilma, dispersiya)*

19. Uzluksiz tasodifiy miqdorlarning zishlik funksiyasi va xossalari *(zichlik funksiya, xossalari).*

20. Variatsion qator uchun poligon va gistogramma *(polygon, gistogramma)*

21. Chiziqli regressiya tenglamasi.

22. Egri chiziqli regressiya tenglamasi.

23. $\int_0^{\frac{\pi}{4}} e^x sin2x dx$ integralni hisoblang

24. $\int_e^{e^2} \frac{\ln^3 x + 3}{x \ln x} dx$ integralni hisoblang.

25. $\int_0^1 arcsin\, x dx$ integralni hisoblang.

26. $\int_0^1 \frac{e^{3x}}{\sqrt{16+e^{6x}}} dx$ integralni hisoblang.

27. $\int_0^{ln2} \frac{dx}{e^x(3+e^{-x})} dx$ integralni hisoblang.

28. $\int_0^{\frac{\pi}{4}} e^x cosx dx$ integralni hisoblang.

29. $\int_0^\infty e^{-x} \cos x \, dx$ xosmas integralni hisoblang.

30. $\int_0^{+\infty} \frac{\sin x}{e^{2x}} dx$ xosmas integralni yaqinlashishga tekshiring.

31. $\lim_{(x,y)\to(0,0)} \frac{1-\sqrt{1-x^2 y}}{x^2 y}$ limitni hisoblang.

32. $\lim_{(x,y)\to(0,0)} (1 + x^2 + y^2)^{-\frac{1}{x^2+y^2}}$ limitni hisoblang

33. Funksiyaning uzilish nuqtalarini toping. $z = \frac{x^2 y^2}{x^2 + y^2}$

34. Ikki o'zgaruvchili funksiyaning hosilasini ta'rif yordamida hisoblang $z = x^2 y + 3xy - 3xy^2$

35. Agar $u = x^3 y - xz^3 + y^3 z$ bo'lsa, $u'_x - u'_z$ ni hisoblang.

36. $u = \frac{x^2 + y^2}{z^2}$ bo'lsa, $u'_x + u'_y$ ni hisoblang.

37. Qatorlarni yaqinlashishga Koshining integral alomati bilan tekshiring: $\sum_{n=1}^{\infty} \frac{n+2}{n\sqrt[3]{n}}$

38. Sonli qatorning yaqinlashishini tekshiring: $\sum_{n=1}^{\infty} \frac{2n+1}{n^2+5}$

39. Darajali qatorni yaqinlashish radiusi va yaqinlashish oralig'ini toping: $\sum_{n=1}^{\infty} \left(-\frac{2}{3}\right)^n x^n$.

40. Bir jinsli differensial tenglamani yeching. $2x^3 y' = y(2x^2 - y^2)$

41. $y' + 2y = 3x + 5$ tenglamaning umumiy toping

42. $xy' = \sqrt{x^2 - y^2} + y$ differensial tenglamani yeching.

43. Bir jinsli differensial tenglamani yeching. $xydx + (y^2 + x^2)dy = 0$

44. O'zgaruvchilari ajraladigan differensial tenglamani yeching. $(y + \sqrt{xy})dx = xdy$

45. $xy' + 2y = x^2$ differensial tenglamani yeching.

46. $e^y \, dx + (xe^y - 2y)dy = 0$. to'liq defferensial tenglamani yeching.

47. $(3x^2 - 2x - y)dx + (2y - x + 3y^2)dy = 0$. to'liq defferensial tenglamani yeching.

48. Bir jinsli differensial tenglamani yeching. $y(x + y)dx - x(2x + y)dy =$