4-SHAXSIY UY TOPSHIRIQLARI

1

Berilgan qatorlarning yig‘indisini hisoblang.

1.1. $\sum_{n=1}^{\infty}\frac{1}{n^2+n}$.

1.2. $\sum_{n=1}^{\infty}\frac{3^n+2^n}{6^n}$.

1.3. $\sum_{n=1}^{\infty}\frac{1}{(2n+1)(2n+3)}$.

1.4. $\sum_{n=1}^{\infty}\frac{3^n-2^n}{4^n}$.

1.5. $\sum_{n=1}^{\infty}\frac{1}{(3n-1)(3n+2)}$.

1.6. $\sum_{n=1}^{\infty}\frac{5^n-2^n}{10^n}$.

1.7. $\sum_{n=1}^{\infty}\frac{1}{(5n-1)(5n+4)}$.

1.8. $\sum_{n=1}^{\infty}\frac{4^n-3^n}{12^n}$.

1.9. $\sum_{n=1}^{\infty}\frac{1}{(2n-1)(2n+3)}$.

1.10. $\sum_{n=1}^{\infty}\frac{4^n+3^n}{12^n}$.

1.11. $\sum_{n=1}^{\infty}\frac{1}{(3n-1)(3n+5)}$.

1.12. $\sum_{n=1}^{\infty}\frac{5^n+2^n}{10^n}$.

1.13. $\sum_{n=1}^{\infty}\frac{1}{(4n-3)(4n+5)}$.

1.14. $\sum_{n=1}^{\infty}\frac{5^n+4^n}{20^n}$.

1.15. $\sum_{n=1}^{\infty}\frac{1}{(n+1)(n+4)}$.

1.16. $\sum_{n=1}^{\infty}\frac{5^n-4^n}{20^n}$.

1.17. $\sum_{n=1}^{\infty}\frac{1}{(n+1)(n+3)}$

1.18. $\sum_{n=1}^{\infty}\frac{7^n+3^n}{21^n}$.

1.19. $\sum_{n=1}^{\infty}\frac{1}{(4n-1)(4n+5)}$.

1.20. $\sum_{n=1}^{\infty}\frac{7^n-3^n}{21^n}$.

1.21. $\sum_{n=1}^{\infty}\frac{1}{(n+3)(n+4)}$.

1.22. $\sum_{n=1}^{\infty}\frac{8^n-3^n}{24^n}$.

1.23. $\sum_{n=1}^{\infty}\frac{1}{(3n-1)(3n+2)}$.

1.24. $\sum_{n=1}^{\infty}\frac{8^n+3^n}{24^n}$.

1.25. $\sum_{n=1}^{\infty}\frac{1}{(2n+1)(2n+3)}$.

1.26. $\sum_{n=1}^{\infty}\frac{9^n+2^n}{18^n}$.

1.27. $\sum_{n=1}^{\infty}\frac{1}{(2n+3)(2n+5)}$

1.28. $\sum_{n=1}^{\infty}\frac{9^n-2^n}{18^n}$.

1.29. $\sum_{n=1}^{\infty}\frac{1}{(n+5)(n+7)}$.

1.30. $\sum_{n=1}^{\infty}\frac{4^n-3^n}{5^n}$.

2

Berilgan qatorlarni yaqinlashishga tekshiring.

2.1. . $\sum_{n=1}^{\infty}\frac{3^n(n+2)!}{n^5}$.

2.2. $\sum_{n=1}^{\infty}\frac{3n-1}{7^n(2n+1)!}$

2.3. $\sum_{n=1}^{\infty}\frac{3^{n-1}}{7^n n^7}$.

2.4. $\sum_{n=1}^{\infty}\frac{(2n-1)!}{3^n(2n+1)}$.

2.5. $\sum_{n=1}^{\infty}\frac{n^n}{2^n(n+1)!}$.

2.6. $\sum_{n=1}^{\infty}n\sin\frac{2\pi}{3^n}$.

2.7. $\sum_{n=1}^{\infty}(3n+1)tg\frac{\pi}{3^n}$.

2.8. $\sum_{n=1}^{\infty}\frac{1\cdot4\cdot7\cdot...\cdot(3n-2)}{2\cdot3\cdot4\cdot...\cdot(n+1)}$.

2.9. $\sum_{n=1}^{\infty}n^3tg\frac{2\pi}{5^n}$.

2.10. $\sum_{n=1}^{\infty}\frac{7^n(3n-1)}{(2n+1)!}$

2.11. $\sum_{n=1}^{\infty}\frac{n^n}{(n+1)!}$

2.12. $\sum_{n=1}^{\infty}\frac{(n+2)!}{n^n}$

2.13. $\sum_{n=1}^{\infty}\frac{5^n}{4(n+1)!}$

2.14. $\sum_{n=1}^{\infty}\frac{1\cdot4\cdot7\cdot...\cdot(3n-2)}{2\cdot7\cdot12\cdot...\cdot(5n-3)}$.

2.15. $\sum_{n=1}^{\infty}\frac{(2n+1)!}{2^n(n+1)}$.

2.16. $\sum_{n=1}^{\infty}\frac{(2n-1)^3}{(2n)!}$.

2.17. $\sum_{n=1}^{\infty}\frac{(2n^2-1)}{(n+2)!}$.

2.18. $\sum_{n=1}^{\infty}\frac{3n-1}{\sqrt{5^n(2n+1)}}$.

2.19. $\sum_{n=1}^{\infty}\frac{4n+1}{\sqrt{n\cdot5^n}}$.

2.20. $\sum_{n=1}^{\infty}(3n-1)\sin\frac{\pi}{4^n}$.

2.21. $\sum_{n=1}^{\infty}\frac{2n+1}{\sqrt{n\cdot2^n}}$.

2.22. $\sum_{n=1}^{\infty}\frac{1\cdot5\cdot9\cdot...\cdot(4n-3)}{1\cdot4\cdot7\cdot...\cdot(3n-2)}$.

2.23. $\sum_{n=1}^{\infty}\frac{1\cdot4\cdot7\cdot...\cdot(3n-2)}{n^2(n+2)!}$.

2.24. $\sum_{n=1}^{\infty}\frac{1\cdot4\cdot7\cdot...\cdot(3n-2)}{2^n(n+3)!}$.

2.25. $\sum_{n=1}^{\infty}\frac{3^n}{5^n(3n+1)}$.

2.26. $\sum_{n=1}^{\infty}\frac{(n+1)!}{2(2n+1)!}$.

2.27. $\sum_{n=1}^{\infty}\frac{5^n(4n-3)}{1\cdot4\cdot7\cdot...\cdot(3n-2)}$

2.28. $\sum_{n=1}^{\infty}\frac{(2n-1)!}{3^n(2n+1)}$.

2.29. $\sum_{n=1}^{\infty}\frac{(n^2+1)}{(n+2)!}$

2.30. $\sum_{n=1}^{\infty}\frac{3^n}{2^n(2n+1)}$

3

Berilgan qatorlarni yaqinlashishga tekshiring.

3.1. $\sum_{n=1}^{\infty}\frac{2^n}{((n+1)/n)^n}$.

3.2. $\sum_{n=1}^{\infty}\left(\frac{5n-1}{5n}\right)^{n^2}$.

3.3. $\sum_{n=1}^{\infty}arctg^n\frac{1}{2n+1}$.

3.4. $\sum_{n=1}^{\infty}\arcsin^{3n}\frac{1}{2^n}$.

3.5. $\sum_{n=1}^{\infty}\frac{1}{\ln^n(n+2)}$.

3.6. $\sum_{n=1}^{\infty}arctg^n\frac{1}{5^n}$.

3.7. $\sum_{n=1}^{\infty}2^n\left(n/(n+1)\right)^{n^2}$.

3.8. $\sum_{n=1}^{\infty}3^n\left(n/(n+1)\right)^{n^2}$.

3.9. $\sum_{n=1}^{\infty}\left(\frac{n^2+5n+3}{3n^2-2}\right)^n$.

3.10. $\sum_{n=1}^{\infty}\frac{4^n}{((n+1)/n)^{n^2}}$.

3.11. $\sum_{n=1}^{\infty}arctg^n\frac{\sqrt{3}n+2}{n+1}$.

3.12. $\sum_{n=1}^{\infty}\arcsin^n\frac{n}{2n+1}$.

3.13. $\sum_{n=1}^{\infty}\left(\frac{n^2+2n+3}{2n^2+1}\right)^n$.

3.14. $\sum_{n=1}^{\infty}\left(\frac{3n-1}{3n}\right)^{n^2}$.

3.15. $\sum_{n=1}^{\infty}\left(\frac{2n^2+3}{3n^2+1}\right)^n$.

3.16. $\sum_{n=1}^{\infty} arcctg^n\sqrt{\frac{n+1}{3n-1}}$.

3.17. $\sum_{n=1}^{\infty}\left(\frac{5n+1}{5n}\right)^{n^2}$

3.18. $\sum_{n=1}^{\infty}\frac{3^n}{((n+1)/n)^n}$.

3.19. $\sum_{n=1}^{\infty}\left(\frac{n+1}{5n}\right)^n$.

3.20. $\sum_{n=1}^{\infty}\frac{n^n}{3^n}$.

3.21. $\sum_{n=1}^{\infty}\frac{5^n}{n^n}\cdot$.

3.22. $\sum_{n=1}^{\infty}\frac{1}{n^n}\cdot\left(\frac{2}{3}\right)^n$

3.23. $\sum_{n=1}^{\infty} arcctg^n\frac{\sqrt{3}n+2}{n+1}$.

3.24. $\sum_{n=1}^{\infty}\arcsin^n\sqrt{\frac{n+1}{2n+1}}$.

3.25. $\sum_{n=1}^{\infty}\frac{((n+1)/n)^n}{3^n}$.

3.26. $\sum_{n=1}^{\infty}\frac{2^n}{\ln^n(n+2)}$.

3.27. $\sum_{n=1}^{\infty}\frac{1}{n^n}\cdot\left(\frac{3}{2}\right)^n$.

3.28. $\sum_{n=1}^{\infty}\left(\frac{2n+1}{5n-1}\right)^n$

3.29. $\sum_{n=1}^{\infty}\arccos^n\frac{n+1}{2n+1}$

3.30. $\sum_{n=1}^{\infty}\left(\frac{3n+1}{5n+1}\right)^n$

4
Berilgan qatorlarni absolyut va shartli yaqinlashishga tekshiring.

4.1. $\sum_{n=1}^{\infty}\frac{(-1)^n n}{2n^2+1}$.

4.2. $\sum_{n=1}^{\infty}\frac{(-1)^n}{\sqrt{2n^2+1}}$.

4.3. $\sum_{n=1}^{\infty}\frac{(-1)^{n+1}n}{6n-1}$.

4.4. $\sum_{n=1}^{\infty}\frac{(-1)^{n+1}}{\sqrt{n^3+1}}$.

4.5. $\sum_{n=1}^{\infty}\frac{(-1)^{n+1}}{\ln(n+1)}$.

4.6. $\sum_{n=1}^{\infty}\frac{(-1)^{n+1}}{n^2+1}$.

4.7. $\sum_{n=1}^{\infty}(-1)^{n+1}tg\frac{\pi}{4\sqrt{n}}$.

4.8. $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{n^2}{n^3+4}$.

4.9. $\sum_{n=1}^{\infty}(-1)^{n-1}n\ln\left(1+\frac{1}{n^2}\right)$.

4.10. $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{2n}{n^2+4}$.

4.11. $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{2^n}{n^2+4}$.

4.12. $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{n+3}{5^n+4}$.

4.13. $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{2n+1}{5n(n+1)}$.

4.14. $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{3n}{\sqrt{n^2+9}}$.

4.15. $\sum_{n=1}^{\infty}(-1)^{n+1} tg\frac{\pi}{3\sqrt[3]{n^2}}$.

4.16. $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{2n-1}{n(n+1)}$.

4.17. $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{1}{\sqrt{n^2+4}}$.

4.18. $\sum_{n=1}^{\infty}\frac{(-1)^{n+1}}{(n+1)\ln(n+1)}$.

4.19. $\sum_{n=1}^{\infty}\frac{(-1)^{n+1}}{(n+1)\ln^2(n+1)}$.

4.20. $\sum_{n=1}^{\infty}(-1)^{n-1}\frac{3^n}{(2n+1)^n}$.

4.21. $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{n+5}{3^n}$.

4.22. $\sum_{n=1}^{\infty}(-1)^{n+1}\sin\frac{\pi}{2\sqrt{n}}$.

4.23. $\sum_{n=1}^{\infty}(-1)^{n-1}\frac{3^n}{(2n+1)!}$.

4.24. $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{n^2}{4^n}$.

4.25. $\sum_{n=1}^{\infty}(-1)^{n-1}\frac{3}{(2n+1)!}$.

4.26. $\sum_{n=1}^{\infty}(-1)^{n-1}\frac{3n!}{(2n+1)!}$.

4.27. $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{2n+1}{n(n+1)}$.

4.28. $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{1}{\sqrt{n^3+4}}$.

4.29. $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{n^2}{2^n}$.

4.30. $\sum_{n=1}^{\infty}(-1)^{n-1}\frac{1}{(3n+1)!}$.

5

Berilgan qatorlarning yaqinlashish sohasini toping.

5.1. $\sum_{n=1}^{\infty}\frac{x^n}{\sqrt{n^2+9}}$.

5.2. $\sum_{n=1}^{\infty}\frac{(x-5)^n}{n\cdot 3^n}$.

5.3. $\sum_{n=1}^{\infty}\frac{(x-3)^n}{(n+1)\ln(n+1)}$.

5.4. $\sum_{n=1}^{\infty}(-1)^n\frac{(x-3)^n}{n\cdot 5^n}$.

5.5. $\sum_{n=1}^{\infty}(-1)^n\frac{(x-2)^n}{2n\cdot 4^n}$.

5.6. $\sum_{n=1}^{\infty}\frac{(3x-2)^n}{n-\ln^2 n}$.

5.7. $\sum_{n=1}^{\infty}\frac{x^n}{(n+1)\ln^2(n+1)}$.

5.8. $\sum_{n=1}^{\infty}\frac{(x+2)^{2n}}{n\cdot 4^n}$.

5.9. $\sum_{n=1}^{\infty}\frac{(x+2)^{2n-1}}{(2n-1)\cdot(2n-1)!}$

5.10. $\sum_{n=1}^{\infty}\frac{(x-1)^n}{2^n\ln(n+1)}$.

5.11. $\sum_{n=1}^{\infty}\frac{2^n x^n}{n^2+1}$.

5.12. $\sum_{n=1}^{\infty}(-1)^{n-1}\frac{n!x^n}{n^n}$.

5.13. $\sum_{n=1}^{\infty}\frac{2^n x^n}{\sqrt{2n+1}}$.

5.14. $\sum_{n=1}^{\infty}\frac{5^n x^n}{(2n+1)\sqrt{3^n}}$.

5.15. $\sum_{n=1}^{\infty}\frac{3^n x^n}{(2n+1)^2\sqrt{3^n}}$.

5.16. $\sum_{n=1}^{\infty}\frac{5^n(x+1)^n}{n^n}$.

5.17. $\sum_{n=1}^{\infty}\frac{3^n(x+2)^n}{n^2}$.

5.18. $\sum_{n=1}^{\infty}\frac{3^n(x+2)^n}{(2n+1)\sqrt{2^n}}$.

5.19. $\sum_{n=1}^{\infty}\frac{5^n(x+3)^n}{n^2+1}$.

5.20. $\sum_{n=1}^{\infty}\frac{\sqrt{n}x^n}{n!}$.

5.21. $\sum_{n=1}^{\infty}\frac{(5n-2)(x-3)^n}{(n^2+1)\cdot 2^{n+1}}$.

5.22. $\sum_{n=1}^{\infty}\frac{(x+5)^{2n-1}}{2n\cdot 4^n}$.

5.23. $\sum_{n=1}^{\infty}\left(\frac{n}{n+1}\right)^{n^2}\frac{x^n}{3^n}$.

5.24. $\sum_{n=1}^{\infty}\frac{3^n x^n}{\sqrt{2n-1}}$.

5.25. $\sum_{n=1}^{\infty}\frac{4^n(x+1)^n}{(n+1)!}$.

5.26. $\sum_{n=1}^{\infty}(-1)^n\frac{(x+1)^{2n-1}}{(2n-1)\cdot(2n-1)!}$.

5.27. $\sum_{n=1}^{\infty}\frac{\sqrt{n^3}(x-2)^n}{n!}$.

5.28. $\sum_{n=1}^{\infty}\left(\frac{n}{n+1}\right)^{n^2}\frac{x^n}{2^n}$

5.29. $\sum_{n=1}^{\infty}(nx)^n$

5.30. $\sum_{n=1}^{\infty}n!\,x^n$

6

$f(x)$ funksiyani berilgan nuqta atrofida Teylor yoki Makloren qatoriga yoying. Hosil bo‘lgan qatorning yaqinlashish sohasini toping.

6.1. $f(x)=x^3 arctgx,\ x_0=0$

6.2. $f(x)=\cos\frac{3x^2}{5},\ x_0=0.$

6.3. $f(x)=\frac{2}{1-3x^2},\ x_0=0.$

6.4. $f(x)=x\cos\sqrt{x},\ x_0=0.$

6.5. $f(x)=\frac{1}{x^2-4x+3},\ x_0=0.$

6.6. $f(x)=\ln(5x+3),\ x_0=-\frac{2}{5}.$

6.7. $f(x)=\sin\frac{\pi x}{6},\ x_0=3.$

6.8. $f(x)=\frac{1}{2x+5},\ x_0=3.$

6.9. $f(x)=\frac{1}{x^2-4x+3},\ x_0=-2.$

6.10. $f(x)=\frac{1}{(x-3)^2},\ x_0=1.$

6.11. $f(x)=e^{2x},\ x_0=1.$

6.12. $f(x)=\frac{1}{\sqrt{e^x}},\ x_0=0.$

6.13. $f(x)=2^{-x^2},\ x_0=0.$

6.14. $f(x)=shx,\ x_0=0.$

6.15. $f(x)=5^x,\ x_0=0.$

6.16. $f(x)=\frac{1}{x},\ x_0=-2.$

6.17. $f(x)=\ln(3x+4),\ x_0=-1.$

6.18. $f(x)=\frac{1}{\sqrt{4+x}},\ x_0=-3.$

6.19. $f(x)=\ln\frac{1}{x^2-2x+2},\ x_0=1.$

6.20. $f(x)=\sqrt{x},\ x_0=4.$

6.21. $f(x)=\sin^2 2x,\ x_0=0.$

6.22. $f(x)=\cos^2 2x,\ x_0=0.$

6.23. $f(x)=\sqrt{1+x^2},\ x_0=0.$

6.24. $f(x)=\sqrt[3]{1+x^3},\ x_0=0.$

6.25. $f(x)=\frac{1}{x},\ x_0=3.$

6.26. $f(x)=\cos\frac{\pi x}{4},\ x_0=2.$

6.27. $f(x)=x^2e^{2x},\ x_0=0.$

6.28. $f(x)=\frac{1}{x+3},\ x_0=-2.$

6.29. $f(x)=\cos x,\ x_0=a.$

6.30. $f(x)=ch(2x^3),\ x_0=0.$

7

Quyidagi (*a, b*) oraliqda berilgan *T* davrli *f*(*x*) funksiyani Furye qatoriga yoying:

7.1. $f(x)=|x|+1,\quad (-\pi;\pi),\quad T=2\pi.$

7.2. $f(x)=x^2+1,\quad (-2;2)\quad T=4.$

7.3. $f(x)=\begin{cases}0, & agar\quad -\pi<x<0\ bo'lsa,\\ x+1, & agar\quad 0\le x<\pi\ bo'lsa.\end{cases}$ $T=2\pi.$

7.4. $f(x)=x-1,\quad (-2;2),\quad T=4.$

7.5. $f(x)=2+|x|,\quad (-1;1),\quad T=2.$

7.6. $f(x)=\frac{\pi-x}{2},\quad (-\pi;\pi),\quad T=2\pi.$

7.7. $f(x)=|x|-2,\quad (-\pi;\pi),\quad T=2\pi.$

7.8. $f(x)=\begin{cases}-2x, & agar\ -\pi<x<0\ bo'lsa,\\ 1, & agar\ 0\le x\le\pi\ bo'lsa.\end{cases}$ $T=2\pi.$

7.9. $f(x)=x+1,\quad (-\pi;\pi)\quad T=2\pi.$

7.10. $f(x)=x^2+1,\quad (0;2\pi),\quad T=2\pi.$

7.11. $f(x)=\begin{cases}-x, & agar\ -\pi<x<0\ bo'lsa,\\ 0, & agar\ 0\le x<\pi\ bo'lsa.\end{cases}$ $T=2\pi.$

7.12. $f(x)=\begin{cases}1, & agar\ -1<x<0\ bo'lsa,\\ 3, & agar\ \ 0\le x\le 1\ bo'lsa.\end{cases}$ $T=2.$

7.13. $f(x)=\sin\dfrac{x}{2},\quad (-\pi;\pi),\quad T=2\pi.$

7.14. $f(x)=\begin{cases}0, & agar\ -\pi<x\le 0\ bo'lsa,\\ 1+x, & agar\ \ 0<x\le \pi\ bo'lsa.\end{cases}$ $T=2\pi.$

7.15. $f(x)=\begin{cases}-1, & agar\ -\pi<x<0\ bo'lsa,\\ 2, & agar\ \ 0\le x\le \pi\ bo'lsa.\end{cases}$ $T=2\pi.$

7.16. $f(x)=\begin{cases}0, & agar\ -2<x<0\ bo'lsa,\\ 3, & agar\ \ 0\le x\le 2\ bo'lsa.\end{cases}$ $T=4.$

7.17. $f(x)=x^2,\quad (-1;1),\quad T=2.$

7.18. $f(x)=\begin{cases}\cos x, & agar\ -\dfrac{\pi}{2}<x<\dfrac{\pi}{2}\ bo'lsa,\\ 0, & agar\ \ \dfrac{\pi}{2}\le x\le\dfrac{3\pi}{2}\ bo'lsa.\end{cases}$ $T=2\pi.$

7.19. $f(x)=|x|+x^2,\quad (-\pi;\pi),\quad T=2\pi.$

7.20. $f(x)=\begin{cases}1, & agar\ -2<x<0\ bo'lsa,\\ -2, & agar\ \ 0\le x\le 2\ bo'lsa.\end{cases}$ $T=4.$

7.21. $f(x)=\begin{cases}x-2, & agar\ -\pi<x<0\ bo'lsa,\\ 2x, & agar\ \ 0\le x\le \pi\ bo'lsa.\end{cases}$ $T=2\pi.$

7.22. $f(x)=\cos\dfrac{x}{2},\quad (-\pi;\pi),\quad T=2\pi.$

7.23. $f(x)=\dfrac{\pi^2}{12}-\dfrac{x^2}{4},\quad (-\pi;\pi),\quad T=2\pi.$

7.24. $f(x)=\begin{cases}\pi, & agar\ -\pi<x<0\ bo'lsa,\\ x, & agar\ \ 0\le x\le \pi\ bo'lsa.\end{cases}$ $T=2\pi.$

7.25. $f(x)=-x|x|,\quad (-1;1),\quad T=2.$

7.26. $f(x)=3-|x|,\quad (-1;1),\quad T=2.$

7.27. $f(x)=\begin{cases}x-1, & agar\ -\pi<x<0\ bo'lsa,\\ 3x, & agar\ \ 0\le x\le \pi\ bo'lsa.\end{cases}$ $T=2\pi.$

7.28. $f(x)=\cos\dfrac{3x}{2},\quad (-\dfrac{\pi}{2};\dfrac{\pi}{2}),\quad T=\pi.$

7.29. $f(x)=|x|-x^2,\quad (-\pi;\pi),\quad T=2\pi.$

7.30. $f(x)=x^2+1,\quad (-\pi;\pi),\quad T=2\pi.$