4.1.2

2-тобы. Өрнекті ықшамдаңыз:

А

1) $\dfrac{\sin(-\alpha)\cdot \operatorname{tg}(-\alpha)}{\cos(-\alpha)\cdot \operatorname{ctg}(-\alpha)}$

2) $\left(1+\operatorname{tg}^2\alpha+\dfrac{1}{\sin^2\alpha}\right)\cdot \sin^2\alpha\cdot\cos^2\alpha$

3) $\dfrac{\sin\alpha}{1-\cos\alpha}+\dfrac{1-\cos\alpha}{\sin\alpha}$

4) $\cos^2\alpha\cdot\left(1+\operatorname{tg}^2\alpha\right)-\sin^2\alpha$

5) $\dfrac{2\sin^2\alpha - 1}{\sin\alpha + \cos\alpha}$

6) $\dfrac{\cos^2\alpha - \sin^2\alpha}{\cos\alpha - \sin\alpha} - \operatorname{tg}\alpha \cdot \cos\alpha$

7) $\dfrac{(\cos\alpha+\sin\alpha)^2-1}{\operatorname{ctg}\alpha-\sin\alpha\cdot\cos\alpha}$

8) $\dfrac{2\sin\alpha-\sin 2\alpha}{2\sin\alpha+\sin 2\alpha}$

9) $\sin^2\alpha+\sin^2\alpha\cdot\cos^2\alpha+\cos^4\alpha$

10) $\sin^2\alpha\cdot(1+\operatorname{ctg}\alpha)+\cos^2\alpha\cdot(1+\operatorname{tg}\alpha)$

11) $\cos^4 2\alpha - \sin^4 2\alpha$

12) $(\operatorname{ctg}\alpha + \operatorname{tg}\alpha)^2 - (\operatorname{ctg}\alpha - \operatorname{tg}\alpha)^2$

13) $\operatorname{tg}\left(\frac{\pi}{4}+\alpha\right)\cdot\operatorname{tg}\left(\frac{\pi}{4}-\alpha\right)$

13) $\operatorname{tg}\left(\frac{\pi}{4}+\alpha\right)\cdot\operatorname{tg}\left(\frac{\pi}{4}-\alpha\right)$

14) $(1+\cos 2\alpha)\cdot \operatorname{tg}\alpha$

15) $(\sin 2\alpha + 3\cos 2\alpha)^2 + (\cos 2\alpha - 3\sin 2\alpha)^2$

16) $\sin^4\alpha+\cos^2\alpha-\cos^4\alpha$

17) $\operatorname{tg}\alpha-\dfrac{1-2\cos^2\alpha}{\sin\alpha\cdot\cos\alpha}$

18) $2\cos^2\frac{\alpha}{2} - \cos\alpha$

19) $\frac{\sin 2\alpha + \sin 10\alpha}{\cos 2\alpha + \cos 10\alpha} \cdot \operatorname{ctg} 6\alpha$

20) $\dfrac{1+\operatorname{tg} 2\alpha+\operatorname{tg}^2 2\alpha}{1+\operatorname{ctg} 2\alpha+\operatorname{ctg}^2 2\alpha}$

21) $\dfrac{1+\cos\alpha}{1-\cos\alpha}\cdot\operatorname{tg}^2\dfrac{\alpha}{2}-\cos^2\alpha$

22) $\dfrac{1+\operatorname{tg}^4 2\alpha}{\operatorname{tg}^2 2\alpha+\operatorname{ctg}^2 2\alpha}-\dfrac{1}{\cos^2 2\alpha}$

23) $\dfrac{\sin\alpha+\sin 3\alpha}{\cos\alpha+\cos 3\alpha}$

24) $\dfrac{\operatorname{ctg}^2 2\alpha - 1}{2\operatorname{ctg} 2\alpha} - \cos 8\alpha \cdot \operatorname{ctg} 4\alpha$

25) $\dfrac{\sin^4 \alpha - \cos^4 \alpha + \cos^2 \alpha}{2(1 - \cos \alpha)}$

26) $\dfrac{1-\cos 2\alpha+\sin 2\alpha}{1+\cos 2\alpha+\sin 2\alpha}$

27) $\dfrac{2}{\sin 4\alpha}-\operatorname{ctg} 2\alpha$

28) $\dfrac{\operatorname{tg}\alpha}{1+\operatorname{tg}^2\alpha}+\dfrac{\operatorname{ctg}\alpha}{1+\operatorname{ctg}^2\alpha}$

29) $4\sin\alpha\cdot\cos^3\alpha-2\sin 2\alpha\cdot\sin^2\alpha$

30) $\dfrac{\sin 2\alpha}{\cos\alpha} + \dfrac{\cos 2\alpha}{\sin\alpha}$

31) $\cos\alpha \cdot \left(1+\cos^{-1}\alpha+\operatorname{tg}\alpha\right)\left(1-\cos^{-1}\alpha+\operatorname{tg}\alpha\right)$

32) $\left(1+\dfrac{1}{\operatorname{tg}^2\left(\frac{\pi}{2}+\alpha\right)}\right)\cdot\sin^2\alpha$

33) $\left(\sin\alpha+\dfrac{1}{\sin\alpha}\right)^2+\left(\cos\alpha+\dfrac{1}{\cos\alpha}\right)^2-\operatorname{tg}^2\alpha-\operatorname{ctg}^2\alpha$

34) $\sin\left(\frac{\pi}{4}-\alpha\right)\cdot\sin\left(\frac{\pi}{4}+\alpha\right)-\cos\left(\frac{\pi}{4}+\alpha\right)\cdot\cos\left(\frac{\pi}{4}-\alpha\right)$

35) $\sqrt{(1-\cos\alpha\cdot\cos\beta)^2-\sin^2\alpha\cdot\sin^2\beta}$

36) $\sin^{-1}\alpha + \mathrm{tg}^{-1}\alpha$

37) $(\sin\alpha + \sin\beta)^2 + (\cos\alpha + \cos\beta)^2$

38) $\dfrac{\sin^2\alpha}{\sin\alpha-\cos\alpha}+\dfrac{\sin\alpha+\cos\alpha}{1-\operatorname{tg}^2\alpha}-\sin\alpha$

39) $\dfrac{\operatorname{tg}2\alpha\cdot\operatorname{tg}\alpha}{\operatorname{tg}2\alpha-\operatorname{tg}\alpha}$

40) $\dfrac{\sin(0{,}5\pi+3\alpha)-\cos(-5\alpha)}{4\sin\alpha\cdot\cos 2\alpha}$

41) $\dfrac{\sin^2(\beta-45°)-\cos^2(\beta-45°)}{\sin 2\beta}$

42) $\dfrac{\sin 6\alpha}{\sin 2\alpha}+\dfrac{\cos(6\alpha-\pi)}{\cos 2\alpha}$

43) $\dfrac{\operatorname{tg}(\alpha+\beta)-\operatorname{tg}\alpha-\operatorname{tg}\beta}{\operatorname{tg}\alpha\cdot\operatorname{tg}(\alpha+\beta)}\cdot\operatorname{ctg}\beta$

44) $\operatorname{tg}\left(\frac{\pi}{4}+\frac{\alpha}{2}\right)\cdot\frac{1-\sin\alpha}{\cos\alpha}$

45) $\cos 4\alpha-\frac{\sin 4\alpha}{\operatorname{tg} 2\alpha}-\cos 2\alpha+2\cos^2\alpha$

46) $\dfrac{1-2\sin^2\alpha}{1+\sin 2\alpha}-\dfrac{1-\operatorname{tg}\alpha}{1+\operatorname{tg}\alpha}$

47) $\dfrac{1-\sin^4\alpha-\cos^4\alpha}{\cos^4\alpha}-2\operatorname{tg}^2\alpha$

48) $\dfrac{\sqrt{2}\cos\alpha - 2\sin(45^\circ - \alpha)}{2\sin(60^\circ + \alpha) - \sqrt{3}\cos\alpha}$

49) $\dfrac{1 - \cos\alpha + \cos 2\alpha}{\sin\alpha - \sin 2\alpha}$

50) $\dfrac{\cos\alpha - 2\sin 3\alpha - \cos 5\alpha}{\sin 5\alpha - 2\cos 3\alpha - \sin\alpha}$

51) $\cos\left(\dfrac{\pi}{3} - 2\alpha\right) \cdot \sin\left(\dfrac{\pi}{6} - 2\alpha\right) + \sin^2 2\alpha$

ЖАУАПТАРЫ

1) $-\operatorname{tg}^3\alpha$ **2)** 1 **3)** $\frac{2}{\sin\alpha}$

4) $\cos^2\alpha$ **5)** $\sin\alpha-\cos\alpha$ **6)** $\cos\alpha$

7) $2\operatorname{tg}^2\alpha$ **8)** $\operatorname{tg}^2\frac{\alpha}{2}$ **9)** 1

10) $(\sin\alpha+\cos\alpha)^2$ **11)** $\cos 4\alpha$ **12)** 4

13) 1 **14)** $\sin 2\alpha$ **15)** 10

16) $\sin^2\alpha$ **17)** $\operatorname{ctg}\alpha$ **18)** 1

19) 1 **20)** $\operatorname{tg}^2 2\alpha$ **21)** $\sin^2\alpha$

22) -1 **23)** $\operatorname{tg}2\alpha$ **24)** $\sin 8\alpha$

25) $\cos^2\frac{\alpha}{2}$ **26)** $\operatorname{tg}\alpha$ **27)** $\operatorname{tg}2\alpha$

28) $\sin 2\alpha$ **29)** $\sin 4\alpha$ **30)** $\frac{1}{\sin\alpha}$

31) $2\sin\alpha$ **32)** $\operatorname{tg}^2\alpha$ **33)** 7

34) 0 **35)** $|\cos\alpha-\cos\beta|$ **36)** $\operatorname{ctg}\frac{\alpha}{2}$

37) $4\cos^2\left(\frac{\alpha-\beta}{2}\right)$ **38)** $\cos\alpha$ **39)** $\sin 2\alpha$

40) $\sin 2\alpha$ **41)** -1 **42)** 2

43) 1 **44)** 1 **45)** 0

46) 0 **47)** 0 **48)** $\sqrt{2}$

49) $-\operatorname{ctg}\alpha$ **50)** $\operatorname{tg}3\alpha$ **51)** 0,25