

**Докажете тождества:**

84.  $(\sin \alpha + \operatorname{tg} \alpha) \cdot (\cos \alpha + \operatorname{ctg} \alpha) = (1 + \sin \alpha) \cdot (1 + \cos \alpha).$

85.  $\cos \alpha + \sin \alpha \cdot \operatorname{tg} \alpha + \cos \alpha \cdot \operatorname{ctg} \alpha + \sin \alpha = \frac{1}{\cos \alpha} + \frac{1}{\sin \alpha}.$

86.  $\cos^2 \alpha (\operatorname{tg} \alpha + 2) \cdot (2 \operatorname{tg} \alpha + 1) - 5 \sin \alpha \cdot \cos \alpha = 2.$

87.  $\sin^3 \alpha \cdot (1 + \operatorname{ctg} \alpha) + \cos^3 \alpha \cdot (1 + \operatorname{tg} \alpha) = \sin \alpha + \cos \alpha.$

88.  $\cos \alpha (1 - \operatorname{tg} \alpha) \cdot (\sin \alpha + \cos \alpha) = \cos^4 \alpha - \sin^4 \alpha.$

89.  $\left( \frac{\cos \alpha}{\operatorname{tg} \alpha} + \frac{\sin \alpha}{\operatorname{ctg} \alpha} \right) : (\operatorname{tg} \alpha + \operatorname{ctg} \alpha - 1) = \sin \alpha + \cos \alpha.$

90.  $(1 + \operatorname{tg}^2 \alpha) \cdot (1 + \operatorname{ctg}^2 \alpha) \cdot \operatorname{tg}^2 \alpha - (1 - \operatorname{tg}^2 \alpha)^2 = 4 \operatorname{tg}^2 \alpha.$

91.  $2 \sin^2 \alpha - \cos^2 \alpha \cdot (\operatorname{tg}^2 \alpha + \operatorname{ctg}^2 \alpha) + (\operatorname{tg} \alpha - \operatorname{ctg} \alpha)^2 = \operatorname{tg}^2 \alpha - 1.$

92.  $\left( \frac{1}{\cos \alpha} + \operatorname{tg} \alpha \right) \cdot \left( \frac{1}{\cos \alpha} - \operatorname{tg} \alpha \right) = 1;$

93.  $\left( \frac{\sin \alpha}{\cos \alpha + \sin \alpha} - \frac{\cos \alpha}{\cos \alpha - \sin \alpha} \right) = \frac{\operatorname{tg}^2 \alpha + 1}{\operatorname{tg}^2 \alpha - 1};$

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

95.  $\sin^6 \alpha + \cos^6 \alpha = 1 - 3 \sin^2 \alpha \cdot \cos^2 \alpha.$

96.  $\frac{(\sin \alpha + \cos \alpha)^2 - 1}{\operatorname{ctg} \alpha - \sin \alpha \cdot \cos \alpha} = 2 \operatorname{tg}^2 \alpha;$

97.  $\left( \operatorname{tg} \alpha + \frac{\cos \alpha}{1 + \sin \alpha} \right) \cdot \left( \operatorname{ctg} \alpha + \frac{\sin \alpha}{1 + \cos \alpha} \right) = \frac{1}{\sin \alpha \cdot \cos \alpha};$

98.  $\frac{1 - \sin^4 \alpha - \cos^4 \alpha}{\cos^4 \alpha} = 2 \operatorname{tg}^2 \alpha;$

99.  $\frac{1}{\cos^4 \alpha + \cos^2 \alpha \cdot \sin^2 \alpha + \sin^2 \alpha + \operatorname{tg}^2 \alpha} = \cos^2 \alpha;$

100.  $\frac{\cos^2 \alpha - \sin^2 \beta}{\sin^2 \alpha \cdot \sin^2 \beta} - \operatorname{ctg}^2 \alpha \cdot \operatorname{ctg}^2 \beta = -1.$

101.  $\frac{1}{\sin^2 \alpha \cdot \cos^2 \alpha} - \frac{(1 - \operatorname{tg}^2 \alpha)^2}{\operatorname{tg}^2 \alpha} = 4;$

102.  $\frac{\sin^2 \alpha - \operatorname{tg}^2 \alpha}{\cos^2 \alpha - \operatorname{ctg}^2 \alpha} = \operatorname{tg}^6 \alpha;$

103.  $\frac{\operatorname{ctg} \alpha \cdot \cos \alpha}{\operatorname{ctg} \alpha + \cos \alpha} = \frac{\operatorname{ctg} \alpha - \cos \alpha}{\operatorname{ctg} \alpha \cdot \cos \alpha};$

**ОТВЕТЫ**

54.  $\frac{1}{\cos^2 \alpha}.$

55.  $2 \cos^2 \alpha.$

56.  $\operatorname{ctg}^2 \alpha.$

57.  $\sin^2 \alpha.$

58.  $\cos^2 \alpha.$

59.  $1 - \cos \alpha.$

60.  $\frac{1}{\sin^2 \alpha}.$

61.  $1.$

62.  $\cos \beta - \sin \beta.$

63.  $\frac{1}{\cos^2 \alpha}.$

64.  $4.$

65.  $-\operatorname{tg} \alpha \cdot \operatorname{tg} \beta.$

66.  $\sin \alpha.$

67.  $\frac{2}{\sin \alpha}.$

68.  $\frac{1}{\cos \alpha}.$

69.  $\cos^2 \beta.$

70.  $2.$

71.  $1.$

72.  $\cos^2 \alpha.$

73.  $\sin^2 \alpha.$