Вариант № 1

1) $2 \sin x + 3 \cos x = 4;$
2) $3 + 2 \sin 2x = \operatorname{tg} x + \operatorname{ctg} x;$
3) $2 \sin^2 x + \cos x - 3 \sin x + 1 = 0;$
4) $\sin x + \cos 4x = 2;$
5) $15 (\sin^2 2x + \sin x + \cos^2 2x)^2 = 17 + 31 \sin x;$
6) $\operatorname{tg}^2 x - 3 \operatorname{tg} x + 4 = 3 \operatorname{ctg} x - \operatorname{ctg}^2 x;$
7) $\cos x \cdot \cos 2x \cdot \cos 4x = \frac{1}{8}.$

Вариант № 2

1) $5 \sin x + \cos 2x - 4 \cos^2 x = 0;$
2) $\sqrt{2 \cos x \cdot \sin 2x} = \sqrt{5 \sin x + 4 \sin 2x};$
3) $2 - \sqrt{3} \cos 2x + \sin 2x = 4 \cos^2 3x;$
4) $\sin 2x = 1 + \sqrt{2} \cos x + \cos 2x;$
5) $4 \sin^2 x - 2 \sin 2x - \cos 2x = 4;$
6) $\cos (8\pi (6x - 5)^2) + \sin (2\pi (6x - 5)^2) = 2;$
7) $2 \sin x - \sin 2x = 4 \cos^2 \frac{x}{2}.$