$$\operatorname{tg}^2(a)+\frac{1}{\sin^2(a)}+\operatorname{ctg}^2(a)+\frac{1}{\cos^2(a)}=7\Leftrightarrow$$

$$\Leftrightarrow\frac{\sin^2(a)}{\cos^2(a)}+\frac{\cos^2(a)}{\sin^2(a)}+\frac{1}{\sin^2(a)}+\frac{1}{\cos^2(a)}-7=0\Leftrightarrow$$

$$\Leftrightarrow\frac{\sin^4(a)+\left(1-7\cos^2(a)\right)\sin^2(a)+\cos^4(a)+\cos^2(a)}{\cos^2(a)\sin^2(a)}=0\overset{\cos^2(a)\sin^2(a)\neq 0}{\Leftrightarrow}$$

$$\Leftrightarrow\sin^4(a)-7\cos^2(a)\sin^2(a)+\sin^2(a)+\cos^4(a)+\cos^2(a)=0\Leftrightarrow$$

$$\Leftrightarrow\sin^4(a)-7\cos^2(a)\sin^2(a)+\cos^4(a)+1=0\Leftrightarrow$$

$$\Leftrightarrow 8\left(1-\sin^2(a)\right)^2+\sin^4(a)-7\left(1-\sin^2(a)\right)+1=0\overset{\sin(a)=x}{\Rightarrow}$$

$$\Rightarrow 8\left(1-x^2\right)^2+x^4-7\left(1-x^2\right)+1=0\Leftrightarrow 9x^4-9x^2+2=0\Leftrightarrow$$

$$\Leftrightarrow\left(3x^2-2\right)\left(3x^2-1\right)=0\Rightarrow x=\left\{\pm\sqrt{\frac{2}{3}},\pm\frac{1}{\sqrt{3}}\right\}\Rightarrow$$

$$\Rightarrow a=\left\{(-1)^k\arcsin\left(\sqrt{\frac{2}{3}}\right)+\pi k,\pi k-(-1)^k\arcsin\left(\sqrt{\frac{2}{3}}\right),\right.$$

$$\left.(-1)^k\arcsin\left(\frac{1}{\sqrt{3}}\right)+\pi k,\pi k-(-1)^k\arcsin\left(\frac{1}{\sqrt{3}}\right)\right\},k\in\mathbb{Z}\Rightarrow$$

$$\Rightarrow\sin^2 a-\sin^4 a=\left\{\frac{1}{4}\sin^2\left(2\left(\pi k+(-1)^k\arcsin\left(\sqrt{\frac{2}{3}}\right)\right)\right),\right.$$

$$\frac{1}{4}\sin^2\left(2\left(\pi k+(-1)^{k+1}\arcsin\left(\sqrt{\frac{2}{3}}\right)\right)\right),\frac{1}{4}\sin^2\left(2\left(\pi k+(-1)^k\arcsin\left(\frac{1}{\sqrt{3}}\right)\right)\right),$$

$$\left.\frac{1}{4}\sin^2\left(2\pi k-2(-1)^k\arcsin\left(\frac{1}{\sqrt{3}}\right)\right)\right\},k\in\mathbb{Z}$$