

Упростить:

$$1) \frac{\cos^2(2\alpha - \frac{\pi}{2}) + \operatorname{ctg}^2(\frac{\pi}{2} + 2\alpha) + 1}{\sin^2(2\alpha - \frac{3\pi}{2}) + \operatorname{tg}^2(\frac{3\pi}{2} + 2\alpha) + 1};$$
$$2) \sin(180^\circ - \alpha) + \cos(90^\circ + \alpha) - \operatorname{tg}(360^\circ - \alpha) + \operatorname{ctg}(270^\circ - \alpha);$$
$$3) \frac{\operatorname{ctg}(\frac{3}{2}\pi - \alpha)}{1 - \operatorname{tg}^2(\alpha - \pi)} \cdot \frac{\operatorname{ctg}^2(2\pi - \alpha) - 1}{\operatorname{ctg}(\pi + \alpha)};$$
$$4) \frac{\operatorname{tg}(270^\circ - \alpha) \cdot \sin 130^\circ \cdot \cos 320^\circ \cdot \sin 270^\circ}{\operatorname{ctg}(180^\circ - \alpha) \cdot \cos 50^\circ \cdot \sin 220^\circ \cdot \cos 360^\circ};$$
$$5) \sin^2(26^\circ + \alpha) + \sin^2(244^\circ - \alpha) + \operatorname{tg}(113^\circ + \alpha) \cdot \operatorname{ctg}(67^\circ - \alpha).$$

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