Zadatak 30. Izračunaj:

1) $\dfrac{\sin 72^\circ \cdot \sin 738^\circ}{2(4\cos^3 18^\circ - 3\sin 72^\circ)}$;

2) $\dfrac{4\sin 8^\circ \cdot \sin 52^\circ \cdot \sin 428^\circ}{4\cos^3 22^\circ - 3\sin 68^\circ}$.

Rješenje. **1)**

$$\frac{\sin 72^\circ \cdot \sin 738^\circ}{2(4\cos^3 18^\circ - 3\sin 72^\circ)} = \frac{\sin 72^\circ \cdot \sin 18^\circ}{2[4\sin^3(90^\circ - 18^\circ) - 3\sin 72^\circ]}$$
$$= \frac{\sin 72^\circ \cdot \cos(90^\circ - 18^\circ)}{2(4\sin^3 72^\circ - 3\sin 72^\circ)} = \frac{\sin 72^\circ \cdot \cos 72^\circ}{2(-\sin(3\cdot 72)^\circ)}$$
$$= \frac{\frac{1}{2}\sin(2\cdot 72)^\circ}{-2\sin 216^\circ} = \frac{\sin 144^\circ}{-4\sin 216^\circ} = \frac{\sin(180^\circ - 144^\circ)}{-4(-\sin(216^\circ - 180^\circ))}$$
$$= \frac{\sin 36^\circ}{4\sin 36^\circ} = \frac{1}{4}$$

2)

$$\frac{4\sin 8^\circ \cdot \sin 52^\circ \cdot \sin 428^\circ}{4\cos^3 22^\circ - 3\sin 68^\circ} = \frac{4\sin 8^\circ \cdot \sin 52^\circ \cdot \sin 68^\circ}{-\sin(3\cdot 68)^\circ} = \frac{4\sin 8^\circ \cdot \sin 52^\circ \cdot \sin 68^\circ}{-\sin 204^\circ}$$
$$= \frac{4\sin 8^\circ \cdot \sin 52^\circ \cdot \sin 68^\circ}{-(-\sin(204^\circ - 180^\circ))} = \frac{4\sin 8^\circ \cdot \sin(60^\circ - 8^\circ)\cdot \sin(60^\circ + 8^\circ)}{\sin 24^\circ}$$
$$= \frac{4\sin 8^\circ \cdot (\sin 60^\circ \cos 8^\circ - \cos 60^\circ \sin 8^\circ)\cdot (\sin 60^\circ \cos 8^\circ + \cos 60^\circ \sin 8^\circ)}{\sin 24^\circ}$$
$$= \frac{4\sin 8^\circ \cdot \left(\frac{3}{4}\cos^2 8^\circ - \frac{1}{4}\sin^2 8^\circ\right)}{\sin 24^\circ} = \frac{\sin 8^\circ \cdot \left(3\cos^2 8^\circ - \sin^2 8^\circ\right)}{\sin 24^\circ}$$
$$= \frac{\sin 8^\circ \cdot \left(3 - 3\sin^2 8^\circ - \sin^2 8^\circ\right)}{\sin 24^\circ} = \frac{\sin 8^\circ \cdot \left(3 - 4\sin^2 8^\circ\right)}{\sin 24^\circ} = \frac{3\sin 8^\circ - 4\sin^3 8^\circ}{\sin 24^\circ}$$
$$= \frac{\sin(3\cdot 8)^\circ}{\sin 24^\circ} = \frac{\sin 24^\circ}{\sin 24^\circ} = 1$$