

**Calculate:**  $\sin 20^\circ * \sin 40^\circ * \sin 60^\circ * \sin 80^\circ$

**Solution:**

$$\begin{aligned}\sin 20^\circ * \sin 40^\circ * \sin 60^\circ * \sin 80^\circ &= \sin 20^\circ * \sin 60^\circ * \sin 40^\circ * \sin 80^\circ \\ &= \sin 20^\circ * \sin 60^\circ * \sin(60^\circ - 20^\circ) * \sin(60^\circ + 20^\circ) \\ &= \sin 20^\circ * \sin 60^\circ * (\sin 60^\circ * \cos 20^\circ - \cos 60^\circ * \sin 20^\circ) \\ &\quad * (\sin 60^\circ * \cos 20^\circ + \cos 60^\circ * \sin 20^\circ) \\ &= \sin 20^\circ * \sin 60^\circ * (\sin^2 60^\circ * \cos^2 20^\circ - \cos^2 60^\circ * \sin^2 20^\circ) \\ &= \sin 20^\circ * \frac{\sqrt{3}}{2} * \left( \frac{3}{4} \cos^2 20^\circ - \frac{1}{4} * \sin^2 20^\circ \right) \\ &= \frac{\sqrt{3}}{8} * \sin 20^\circ * (3 - 3 * \sin^2 20^\circ - \sin^2 20^\circ) \\ &= \frac{\sqrt{3}}{8} (3 * \sin 20^\circ - 4 * \sin^3 20^\circ) = \frac{\sqrt{3}}{8} * \sin(3 * 20^\circ) = \frac{\sqrt{3}}{8} * \sin 60^\circ \\ &= \frac{3}{16}\end{aligned}$$

**Answer:**  $\frac{3}{16}$