

$$\begin{aligned}
 3. \quad & \cos(\underbrace{6A}_\alpha) \cos(\underbrace{2A}_\beta) \\
 & \downarrow \cos \alpha \cos \beta = \frac{1}{2} [\cos(\alpha - \beta) + \cos(\alpha + \beta)] \\
 & = \frac{1}{2} [\cos(6A - 2A) + \cos(6A + 2A)] \\
 & = \boxed{\frac{1}{2} [\cos(4A) + \cos(8A)]}
 \end{aligned}$$

$$\begin{aligned}
 4. \quad & \sin \frac{3A}{2} \cos \frac{7A}{2} \\
 & \downarrow \sin \alpha \cos \beta = \frac{1}{2} [\sin(\alpha + \beta) + \sin(\alpha - \beta)] \\
 & = \frac{1}{2} \left[\sin\left(\frac{3A}{2} + \frac{7A}{2}\right) + \sin\left(\frac{3A}{2} - \frac{7A}{2}\right) \right] \\
 & = \frac{1}{2} \left[\sin \frac{10A}{2} + \sin\left(-\frac{4A}{2}\right) \right] \\
 & = \boxed{\frac{1}{2} [\sin(5A) - \sin(2A)]}
 \end{aligned}$$