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$$\begin{aligned} 2. \int \sin 3x \sin 2x dx &= \int \frac{1}{2} [\cos(3x-2x) - \cos(3x+2x)] dx \\ &= \frac{1}{2} \int \cos x dx - \frac{1}{2} \int \cos 5x dx = \frac{1}{2} \sin x - \frac{1}{2} \cdot \frac{1}{5} \sin 5x + c \\ &= \frac{1}{2} \sin x - \frac{1}{10} \sin 5x + c \end{aligned}$$

$$\begin{aligned} 3. \int \sin 3x \cos 5x dx &= \int \frac{1}{2} [\sin(3x-5x) + \sin(3x+5x)] dx \\ &= \frac{1}{2} \int \sin(-2x) dx + \frac{1}{2} \int \sin 8x dx = \frac{1}{2} \cdot \frac{1}{2} (\cos(-2x)) + \\ &+ \frac{1}{2} \cdot \frac{1}{8} (\cos 8x) + c = \frac{1}{4} \cos(-2x) - \frac{1}{16} \cos 8x + c \end{aligned}$$

$$\begin{aligned} 4. \int \cos 4x \cos 2x dx &= \frac{1}{2} \int [\cos(4x-2x) + \cos(4x+2x)] dx \\ &= \frac{1}{2} \int \cos 2x dx + \frac{1}{2} \int \cos 6x dx = \frac{1}{2} \cdot \frac{1}{2} \sin 2x + \frac{1}{2} \cdot \frac{1}{6} \sin 6x + c \\ &= \frac{1}{4} \sin 2x + \frac{1}{12} \sin 6x + c \end{aligned}$$

$$\begin{aligned} 5. \int \sqrt{1-\cos x} dx &= \int \sqrt{2 \sin^2 \frac{x}{2}} dx = 2 \int \sqrt{\sin^2 \frac{x}{2}} dx \\ &= 2 \int \sin \frac{x}{2} dx = \underline{-2x \cos \frac{x}{2} + c} \end{aligned}$$