(11) $\int \sin^4 x \cos^2 x \, dx$ $\qquad \sin^2 x = \dfrac{1 - \cos 2x}{2}$

$$\int \sin^2 x \sin^2 x \cos^2 x \, dx$$

$$\int \left(\frac{1-\cos 2x}{2}\right)\left(\frac{1-\cos 2x}{2}\right) \cos^2 x \, dx$$

$$\frac{1}{4}\int \left(1 - 2\cos 2x + \cos^2 2x\right) \cos^2 x \, dx$$

$$\frac{1}{4}\int \left(1 - 2\cos 2x + \frac{1+\cos 4x}{2}\right)\left(\frac{1+\cos 2x}{2}\right) dx$$

$$\frac{1}{8}\int \left(\frac{3}{2} - 2\cos 2x + \frac{\cos 4x}{2}\right)\left(1 + \cos 2x\right) dx$$

$$\frac{1}{8}\int \frac{3}{2} + \frac{3}{2}\cos 2x - 2\cos 2x - 2\cos^2 2x + \frac{\cos 4x}{2} + \frac{\cos 4x \cos 2x}{2} \, dx$$

$$\frac{1}{8}\int \frac{3}{2} + \frac{3}{2}\cos 2x - 2\cos 2x - 2\left(\frac{1+\cos 4x}{2}\right) + \frac{\cos 4x}{2} + \frac{\cos 4x \cos 2x}{2} \, dx$$

$$\cos(m+n) = \cos m \cos n - \sin m \sin n$$

$$\cos(m-n) = \cos m \cos n + \sin m \sin n$$

$$\frac{\cos(m+n) + \cos(m-n)}{2} = \cancel{2}\cos m \cos n$$

$$\int \cos 2x \cos 4 \, dx = \int \frac{\cos 6x + \cos 2x}{2} \, dx$$