

55. $x = \sqrt{3} \tan \theta, dx = \sqrt{3} \sec^2 \theta d\theta,$

$$\frac{1}{3} \int \frac{1}{\sec \theta} d\theta = \frac{1}{3} \int \cos \theta d\theta = \frac{1}{3} \sin \theta + C = \frac{x}{3\sqrt{3+x^2}} + C$$

56. $u = x, dv = \cos 3x dx, du = dx, v = \frac{1}{3} \sin 3x;$

$$\int x \cos 3x dx = \frac{1}{3} x \sin 3x - \frac{1}{3} \int \sin 3x dx = \frac{1}{3} x \sin 3x + \frac{1}{9} \cos 3x + C$$

57. $\int \tan^7 \theta d\theta = \frac{1}{6} \tan^6 \theta - \frac{1}{4} \tan^4 \theta + \frac{1}{2} \tan^2 \theta + \ln |\cos \theta| + C.$