

1. $\int \frac{x}{x-1} dx$

2. $\int x \ln x dx$

3. $\int \frac{9z-23}{2z^2+2z-12} dz$

4. $\int_0^{\frac{\pi}{4}} 1 - \sin^2 3\alpha d\alpha$

5. $\int e^x \sin x dx$

6. $\int \frac{4r^2+8r-1}{r+1} dr$

7. $\int \cos^3 \theta \sin^2 \theta d\theta$

8. $\int x^2 \sin x dx$

9. $\int_0^1 \arcsin x dx$

10. $\int \frac{x+2}{x^2+4x+3} dx$

11. $\int \frac{3x^2-2x+1}{x-1}$

12. $\int x^2 \ln x dx$

Answers:

1. $x + \ln|x-1| + C$

2. $\frac{1}{2}x^2 \ln x - \frac{1}{4}x^2 + C$

3. $5 \ln|z+3| - \frac{1}{2} \ln|z-2| + C$

4. $\frac{\pi}{8} - \frac{1}{12}$

5. $\frac{1}{2}(e^x \sin x - e^x \cos x)$

6. $2r^2 + 4r - 5 \ln|r+1| + C$

7. $\frac{1}{3} \sin^3 \theta - \frac{1}{5} \sin^5 \theta + C$

8. $-x^2 \cos x + 2x \sin x + 2 \cos x + C$

9. $\frac{\pi}{2} - 1$

10. $\frac{1}{2} \ln|x+3| + \frac{1}{2} \ln|x+1| + C$

11. $\frac{3}{2}x^2 + x + 2 \ln|x-1| + C$

12. $\frac{1}{3}x^3 \ln x - \frac{1}{9}x^3 + C$

