

u-Substitution - Homework

1. $\int \sqrt{x-2} \, dx$

$$\frac{2(x-2)^{\frac{3}{2}}}{\frac{3}{2}} + C$$

2. $\int (2x+3)^{11} \, dx$

$$\frac{(2x+3)^{12}}{\frac{12}{2}} + C$$

3. $\int \sqrt{5x-1} \, dx$

$$\frac{2(5x-1)^{\frac{3}{2}}}{\frac{3}{2} \cdot 5} + C$$

4. $\int \sqrt[3]{6x+1} \, dx$

$$\frac{(6x+1)^{\frac{4}{3}}}{\frac{4}{3} \cdot 6} + C$$

5. $\int 5(3-4x)^{\frac{2}{3}} \, dx$

$$\frac{-3(3-4x)^{\frac{5}{3}}}{\frac{5}{3} \cdot 4} + C$$

6. $\int \frac{dx}{(8x-1)^3}$

$$\frac{-1}{16(8x-1)^2} + C$$

$$7. \int x(x^2 + 2)^6 dx$$

$$\frac{(x^2 + 2)^7}{14} + C$$

$$9. \int \left(1 + \frac{1}{x}\right)^3 \left(\frac{1}{x^2}\right) dx$$

$$\frac{-\left(1 + \frac{1}{x}\right)^4}{4} + C$$

$$11. \frac{2}{3} \int \sqrt{4 - \frac{3}{5}x} dx$$

$$\frac{-20\left(4 - \frac{3}{5}x\right)^{\frac{3}{2}}}{27} + C$$

$$8. \int 6x^2 \sqrt{3x^3 - 1} dx$$

$$\frac{4(3x^3 - 1)^{\frac{3}{2}}}{9} + C$$

$$10. \int x^{\frac{1}{3}} \left(x^{\frac{4}{3}} + 9\right)^8 dx$$

$$\frac{\left(x^{\frac{4}{3}} + 9\right)^9}{12} + C$$

$$12. \int (3x + 15) \sqrt{x^2 + 10x + 4} dx$$

$$\left(x^2 + 10x + 4\right)^{\frac{3}{2}} + C$$

$$13. \int (x+2)\sqrt{x-2} \, dx$$

$$\frac{2(x-2)^{\frac{5}{2}}}{5} + \frac{8(x-2)^{\frac{3}{2}}}{3} + C$$

$$15. \int \sin 5x \, dx$$

$$\frac{-\cos 5x}{5} + C$$

$$17. \int \frac{1}{3} \sec^2 8x \, dx$$

$$\frac{\tan 8x}{24} + C$$

$$14. \int \frac{x^2}{\sqrt{x-4}} \, dx$$

$$\frac{2(x-4)^{\frac{5}{2}}}{5} + \frac{16(x-4)^{\frac{3}{2}}}{3} + 32(x-4)^{\frac{1}{2}} + C$$

$$16. \int \cos \frac{x}{2} \, dx$$

$$2 \sin \frac{x}{2} + C$$

$$18. \int \sin 4x \cos 4x \, dx$$

$$\frac{\sin^2 4x}{8} + C \text{ or } \frac{-\cos^2 4x}{8} + C$$

$$19. \int \cos^3 x \sin x \, dx$$

$$\frac{-\cos^4 x}{4} + C$$

$$20. \int \tan x \sec^2 x \, dx$$

$$\frac{\tan^2 x}{2} + C$$

$$21. \int \sqrt{\cos 6x} \sin 6x \, dx$$

$$\frac{-(\cos(6x))^{\frac{3}{2}}}{\frac{3}{2}} + C$$

$$22. \int \frac{\sin x}{(4 - \cos x)^3} \, dx$$

$$\frac{-1}{2(4 - \cos x)^2} + C$$