

$$1) \int (x+2)^3 \cdot 1 \cdot dx = \int (x+2)^3 \cdot \underbrace{(x+2)'} \cdot dx$$

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

$$2) \int (3x-1)^2 dx = \int (3x-1)^2 \cdot 3 \cdot \frac{1}{3} dx$$

$$= \frac{1}{3} \int (3x-1)^2 \cdot \underbrace{(3x-1)'} \cdot dx = \frac{1}{3} \cdot \frac{1}{2+1} \cdot (3x-1)^{2+1} + C$$

$$= \frac{1}{3} \cdot \frac{1}{3} \cdot (3x-1)^3 + C = \frac{1}{9} \cdot (3x-1)^3 + C$$

$$3) \int (7x-2)^5 dx = \int (7x-2)^5 \cdot 7 \cdot \frac{1}{7} dx =$$

$$\frac{1}{7} \int (7x-2)^5 \cdot \underbrace{(7x-2)'} \cdot dx = \frac{1}{7} \cdot \frac{1}{5+1} \cdot (7x-2)^{5+1} + C$$

$$= \frac{1}{42} \cdot (7x - 2)^6 + C$$

$$4) \int (2x+1)^{\frac{1}{2}} \cdot 2 \cdot \frac{1}{2} dx =$$

$$\frac{1}{2} \int (2x+1)^{\frac{1}{2}} \cdot (2x+1)' \cdot dx =$$

$$\frac{1}{2} \cdot \frac{1}{\frac{1}{2}+1} \cdot (2x+1)^{\frac{1}{2}+1} + C =$$

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

$$= \frac{1}{3} (2x+1)^{\frac{3}{2}} + C = \frac{1}{3} \sqrt{(2x+1)^3} + C$$

$$5) \int \cos(3x+\pi) \cdot 3 \cdot \frac{1}{3} dx = \frac{1}{3} \int \cos(3x+\pi) \cdot (3x+\pi)' dx$$


$$= \frac{1}{3} \ln(3x + \pi) + C$$

$$6) \int \sin^2 x \cdot \cos x \, dx = \int \sin^2 x \cdot \underbrace{(\sin x)'}_{\text{red arrow}} \, dx$$

$$= \int (\sin x)^2 \cdot (\sin x)' \cdot dx$$

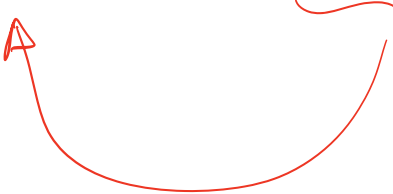
$$= \frac{1}{3} (\sin x)^3 + C = \frac{1}{3} \sin^3 x + C$$

$$7) \int (3x^2 + 1)^4 \cdot 6x \cdot \frac{1}{6} \, dx =$$

$$\frac{1}{6} \int (3x^2 + 1)^4 \cdot \underbrace{(3x^2 + 1)'}_{\text{red arrow}} \cdot dx =$$

$$\frac{1}{6} \cdot \frac{1}{4+1} \cdot (3x^2 + 1)^{4+1} + C = \frac{1}{30} \cdot (3x^2 + 1)^5 + C$$

$$8) \int (3x^2+x)^{-3} \cdot (6x+1) dx =$$

$$\int (3x^2+x)^{-3} \cdot \underbrace{(3x^2+x)'} dx =$$


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

$$9) \int \frac{1}{(x^2+2x)^4} \cdot (x+1) dx =$$

$$\int \frac{1}{(x^2+2x)^4} \cdot \frac{2 \cdot \overbrace{(x+1)}' }{2} dx =$$


$$\int \frac{1}{(x^2+2x)^4} \cdot (2x+2) \cdot \frac{1}{2} dx =$$

$$\frac{1}{2} \int \frac{1}{(x^2+2x)^4} \cdot (2x+2) dx =$$

$$\frac{1}{2} \int \frac{1}{(x^2+2x)^4} \cdot (x^2+2x)' dx =$$

$$\frac{1}{2} \int (x^2+2x)^{-4} \underbrace{(x^2+2x)'} dx =$$

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

$$-\frac{1}{6} \cdot (x^2+2x)^{-3} + C = -\frac{1}{6(x^2+2x)^3} + C$$

$$10) \int (x^3+1)^{-\frac{1}{2}} \cdot x^2 dx = \frac{1}{3} \int (x^3+1)^{-\frac{1}{2}} \cdot 3x^2 dx$$

$$= \frac{1}{3} \int (x^3+1)^{-\frac{1}{2}} \cdot \underbrace{(x^3+1)'} dx$$

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

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

$$= \frac{2}{3} \sqrt{x^3+1} + C$$