Sujet A

Ex 1

1) $f(x) = \frac{4x^3}{5} - \frac{3}{\sqrt{x}} = \frac{4}{5} \times x^3 - 3 \times \frac{1}{\sqrt{x}}$

$F(x) = \frac{4}{5} \times \frac{x^4}{4} - 3 \times 2\sqrt{x} = \boxed{\frac{1}{5}x^4 - 6\sqrt{x}}$

2) $f(x) = -2\cos(x) + x$

$F(x) = -2\sin(x) + \frac{x^2}{2}$

3) $f(x) = \frac{2}{3x^2} - 3 = \frac{2}{3} \times \frac{1}{x^2} - 3$

$F(x) = \frac{2}{3} \times \frac{-1}{x} - 3x = \boxed{-\frac{2}{3x} - 3x}$

4) $f(x) = 2e^x - 3\sin(x)$

$\boxed{F(x) = 2e^x + 3\cos(x)}$

5) $f(x) = \frac{x}{7} + \frac{2}{x^3} = \frac{1}{7} \times x + 2 \times \frac{1}{x^3} = \frac{1}{7} \times x + 2x^{-3}$

$F(x) = \frac{1}{7} \times \frac{x^2}{2} + 2 \times \frac{x^{-2}}{-2} = \boxed{\frac{1}{14}x^2 - \frac{1}{x^2}}$

Ex 2

$f(x) = -2x^2 + 1$

$F(x) = -2 \times \frac{x^3}{3} + x + C$ avec $C \in \mathbb{R}$

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

$F(-1) = 4$ donc $-\frac{2}{3}(-1)^3 + (-1) + C = 4$

$\frac{2}{3} - 1 + C = 4$

$C = 5 - \frac{2}{3}$

$C = \frac{13}{3}$

donc $\boxed{F(x) = -\frac{2}{3}x^3 + x + \frac{13}{3}}$

5 sin → 2a sin

Sujet B

Ex 1

1) $f(x) = 5e^x - 2\sin(x)$

$\boxed{F(x) = 5e^x + 2\cos(x)}$

2) $f(x) = \frac{2x^3}{3} - \frac{5}{\sqrt{x}} = \frac{2}{3} \times x^3 - 5 \times \frac{1}{\sqrt{x}}$

$F(x) = \frac{2}{3} \times \frac{x^4}{4} - 5 \times 2\sqrt{x} = \boxed{\frac{x^4}{6} - 10\sqrt{x}}$

3) $f(x) = \frac{2}{3x^2} - 1 = \frac{2}{3} \times \frac{1}{x^2} - 1$

$F(x) = \frac{2}{3} \times \left(-\frac{1}{x}\right) - x = \boxed{-\frac{2}{3x} - x}$

4) $f(x) = x - 3\cos(x)$

$\boxed{F(x) = \frac{x^2}{2} - 3\sin(x)}$

5) $f(x) = \frac{x}{3} + \frac{4}{x^3} = \frac{1}{3} \times x + 4 \times \frac{1}{x^3} = \frac{1}{3} \times x + 4 \times x^{-3}$

$F(x) = \frac{1}{3} \times \frac{x^2}{2} + 4 \times \frac{x^{-2}}{-2} = \boxed{\frac{x^2}{6} - \frac{2}{x^2}}$

Ex 2

$f(x) = -4x^2 + 2$

$F(x) = -4 \times \frac{x^3}{3} + 2x + C$ avec $C \in \mathbb{R}$

$F(-1) = 2$

donc $-4 \times \frac{(-1)^3}{3} + 2(-1) + C = 2$

donc $\frac{4}{3} - 2 + C = 2$

$C = 4 - \frac{4}{3}$

$C = \frac{12-4}{3}$ $\quad C = \frac{8}{3}$

Donc $\boxed{F(x) = -\frac{4}{3}x^3 + 2x + \frac{8}{3}}$