

$$(1) \frac{1}{x-5} - \frac{1}{x-3} \quad \frac{x-3-x+5}{(x-5)(x-3)} = \frac{2}{(x-5)(x-3)}$$

$$\int \frac{2}{(x-5)(x-3)} dx = \ln|x-5| - \ln|x-3| + C$$

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

$$\int \frac{4}{x^2-1} dx = 2\ln|x-1| - 2\ln|x+1| + C$$

$$(3) \frac{1}{2x} - \frac{1/2}{x+2} \quad \int \frac{dx}{2x} - \int \frac{1/2 dx}{x+2} = \frac{1}{2}\ln|x| - \frac{1}{2}\ln|x+2| + C$$

$$(4) \frac{1}{x-3} - \frac{2}{x+4} \quad \int \frac{dx}{x-3} - \int \frac{2dx}{x+4} = \ln|x-3| - 2\ln|x+4| + C$$

$$(5) \frac{-2}{x+3} + \frac{5}{2x-1} \quad (6) \frac{7/3}{(x-3)^2} - \frac{25/9}{x-3} + \frac{25/9}{x}$$

$$(7) \frac{2}{x-3} - \frac{1}{x^2} + \frac{1}{x} \quad (8) \frac{2}{x-1} - \frac{x}{x^2+x+1}$$

$$(9) \frac{2x^2+x+3}{x^2-1} = 2 + \frac{x+5}{x^2-1}; \quad \frac{r(x)}{h(x)} = \frac{x+5}{x^2-1} = \frac{3}{x-1} - \frac{2}{x+1};$$

$$\int \frac{2x^2+x+3}{x^2-1} dx = 2 \int dx + 3 \int \frac{dx}{x-1} - 2 \int \frac{dx}{x+1}$$

$$= 2x + 3\ln|x-1| - 2\ln|x+1| + C$$

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

$$\frac{r(x)}{h(x)} = \frac{x-2}{x^2+x} = -\frac{2}{x} + \frac{3}{x+1}; \quad \int \frac{x^3-2}{x^2+x} dx = \int x dx - \int dx - 2 \int \frac{dx}{x} + 3 \int \frac{dx}{x+1}$$

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

$$f(x) = 2x - 1 + \frac{-x+10}{x^2-4} \quad (11)$$

$$r(x) = \frac{-x+10}{x^2-4}$$

$$r(x) = \frac{2}{x-2} - \frac{3}{x+2} \quad (ب)$$

$$f(x) = 2x - 1 + \frac{2}{x-2} - \frac{3}{x+2} \quad (ج)$$

$$\int \frac{2x^3-x^2-9x+14}{x^2-4} dx = 2 \int x dx - \int dx + 2 \int \frac{dx}{x-2} - 3 \int \frac{dx}{x+2}$$

$$= x^2 - x + 2\ln|x-2| - 3\ln|x+2| + C$$