

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

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

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

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

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

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

(19)

$$Q10 :- \int \frac{x}{(x-1)(x^2+1)} dx = \frac{1}{2} \ln|x-1| - \frac{1}{4} \ln|x^2+1| + \frac{1}{2} \tan^{-1}x + C$$

$$\frac{x}{(x-1)(x^2+1)} = \frac{A}{x-1} + \frac{Bx+C}{x^2+1}$$

(20)

$$Q11 :- \int \frac{9x-7}{(x+3)(x^2+1)} dx = \frac{-17}{5} \ln|x+3| + \frac{17}{10} \ln|x^2+1| - \frac{6}{5} \tan^{-1}x + C$$

$$\frac{9x-7}{(x+3)(x^2+1)} = \frac{A}{x+3} + \frac{Bx+C}{x^2+1}$$