

$$\textcircled{13} \quad \int \frac{8x-7}{2x^2-x-3} dx = \int \frac{8x-7}{(x+1)(2x-3)} dx = \int \left(\frac{A}{x+1} + \frac{B}{2x-3} \right) dx$$

$$A(2x-3) + B(x+1) = 8x-7$$

$$x = -1 \quad -5A = -15 \Rightarrow A = 3$$

$$x = \frac{3}{2} \quad \frac{2}{5} \cdot \frac{5}{2} B = 5 \cdot \frac{2}{5} \Rightarrow B = 2$$

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

$$u = 2x-3 \\ du = 2dx$$

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

$$\ln |x+1|^3 + \ln |2x-3|$$

$$\ln | (x+1)^3 (2x-3) | + C$$

$$\textcircled{17} \quad F'(x) = \frac{2}{x^3-x}$$

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

$$A(x-1)(x+1) + Bx(x+1) + Cx(x-1) = 2 \int \left(\frac{A}{x} + \frac{B}{x-1} + \frac{C}{x+1} \right) dx$$

$$x=0 \Rightarrow -A = 2 \Rightarrow A = -2$$

$$x=1 \Rightarrow 2B = 2 \Rightarrow B = 1$$

$$x=-1 \Rightarrow 2C = 2 \Rightarrow C = 1$$

$$\int \left(\frac{-2}{x} + \frac{1}{x-1} + \frac{1}{x+1} \right) dx$$

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

$$\ln \left| \frac{(x-1)(x+1)}{x^2} \right| + C$$