

fixed ① $\int \left[5e^{3x} + \frac{1}{3x} - \frac{1}{2}x^{3/2} \right] dx = 5 \int e^{3x} dx + \frac{1}{3} \int \frac{1}{x} dx - \frac{1}{2} \int x^{3/2} dx$

$$= 5 \cdot \frac{1}{3} \int 3e^{3x} dx + \frac{1}{3} \ln|x| - \frac{1}{2} \cdot \frac{x^{5/2}}{\frac{5}{2}}$$

$$= \boxed{\frac{5}{3} e^{3x} + \frac{1}{3} \ln|x| - \frac{x^{5/2}}{5} + C}$$

② $\int (3x+4)^5 dx = \frac{1}{3} \int 3(3x+4)^5 dx = \frac{1}{3} \frac{(3x+4)^6}{6} = \boxed{\frac{(3x+4)^6}{18} + C}$

fixed ③ $\int \sqrt[4]{x^3} dx = \int x^{3/4} dx = \frac{x^{7/4}}{\frac{7}{4}} = \boxed{\frac{4}{7} x^{7/4} + C}$

④ $\int \frac{5x^4 + 4x^3 - 10}{x^3} dx = \int \left(5x + 4 - \frac{10}{x^3} \right) dx$

$$= 5 \int x dx + 4 \int dx - 10 \int \frac{1}{x^3} dx$$

$$= 5 \cdot \frac{x^2}{2} + 4x - 10 \int x^{-3} dx$$

$$= \frac{5}{2} x^2 + 4x - 10 \frac{x^{-2}}{-2} + C$$

$$= \boxed{\frac{5}{2} x^2 + 4x + 5 \cdot x^{-2} + C}$$

(2) typos in #1, #3 fixed 4/13