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1. (i)

$$\int sin\left(\sqrt{3x+7}\right)dx$$
$$\Downarrow$$
$$\int f(x)dx = \frac{2\cdot(sin(\sqrt{3x+7}) - \sqrt{3x+7}\cdot cos(\sqrt{3x+7}))}{3} + C$$

(ii)

$$\int cos\left(\sqrt[3]{x}\right)dx$$
$$\Downarrow$$
$$\int f(x)dx = 3\left(x^{\frac{2}{3}} - 2\right)sin\left(\sqrt[3]{x}\right) + 6\sqrt[3]{x}cos\left(\sqrt[3]{x}\right) + C$$

(iii)

$$\int e^{\sqrt{5x+3}}dx$$
$$\Downarrow$$
$$\int f(x)dx = \frac{2}{5}e^{\sqrt{5x+3}}(\sqrt{5x+3} - 1) + C$$

(iv)

$$\int ln(4x+3)dx \left(\text{ für } x > -\frac{3}{4}\right)$$
$$\Downarrow$$
$$\int f(x)dx = \frac{(4x+3)\cdot ln(4x+3) - 4x - 3}{4} + C$$

2. (i)

$$\int \frac{x+1}{x^2-x-6}dx$$
$$\Downarrow$$
$$\int f(x)dx = \frac{1}{5}(4log(3-x) + log(x+2)) + C$$

(ii)

$$\int \frac{2x+1}{x^2-4x+4}dx$$
$$\Downarrow$$
$$\int f(x)dx = 2 \cdot log(x-2) - \frac{5}{x-2} + C$$

(iii)

$$\int \frac{4x+1}{x^2+4x+8}dx$$
$$\Downarrow$$
$$\int f(x)dx = 2 \cdot log(x^2+4x+8) - \frac{7}{2}tan^{-1}\left(\frac{x+2}{2}\right) + C$$

3. **TODO**

4. **TODO**