

$$\underline{7} \int \frac{2x+9}{(2x^2+18x)^4} dx$$

$$\text{Let } 2x^2+18x = u$$

$$\frac{du}{dx} = 4x+18$$

$$du = 2(2x+9) dx$$

$$\frac{1}{2} du = (2x+9) dx$$

$$= \int \frac{1}{u^4} \frac{1}{2} du$$

$$= \frac{1}{2} \int \frac{1}{u^4} du$$

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

$$= -\frac{1}{6u^3} + C$$

$$= \boxed{-\frac{1}{6(2x^2+18x)^3} + C}$$

$$\underline{8} \int \frac{3e^{3x}}{1+e^{3x}} dx$$

$$\text{Let } u = e^{3x}$$

$$\frac{du}{dx} = 3e^{3x}$$

$$du = 3e^{3x} dx$$

$$= \int \frac{du}{1+u}$$

$$= \ln|1+u| + C \quad [\text{Use substitution again on } 1+u]$$

$$= \boxed{\ln|1+e^{3x}| + C}$$

9 (a) Sample points = -2, -1, 0, 1

$$\text{Width of each interval} = \frac{2 - (-2)}{4} = 1$$

$$\text{Area} = 1 \cdot [(-2)^2 + 5 + (-1)^2 + 5 + (0)^2 + 5 + (1)^2 + 5]$$

$$= 1 \cdot [9 + 6 + 5 + 6]$$

$$= \boxed{26}$$