

$$\begin{aligned} 27.) \quad \int \frac{x+6}{\sqrt{x}} dx &= \int x^{-1/2} (x+6) dx \\ &= \int (x^{1/2} + 6x^{-1/2}) dx = \frac{x^{3/2}}{3/2} + \frac{6x^{1/2}}{1/2} + C \\ &= \frac{2}{3}x^{3/2} + 12x^{1/2} + C \end{aligned}$$

$$33.) \int dx$$

$$\int 1 dx = x + C$$

Evaluate

$$1.) \int \frac{x^2 + x - 7}{x^5} dx$$

$$2.) \int (\cos x - \sin x) dx$$

$$3.) \int (3x - 4)^2 dx$$

$$4.) \int dv$$

Evaluate

$$1.) \int \frac{x^2 + x - 7}{x^5} dx$$

$$\int (x^{-3} + x^{-4} - 7x^{-5}) dx$$

$$\frac{x^{-2}}{-2} + \frac{x^{-3}}{-3} - \frac{7x^{-4}}{-4} + C$$

$$3.) \int (3x-4)^2 dx$$

$$\int (9x^2 - 24x + 16) dx$$

$$3x^3 - 12x^2 + 16x + C$$

$$2.) \int (\cos x - \sin x) dx$$
$$\sin x + \cos x + C$$

$$4.) \int dv = \int 1 dv$$
$$= v + C$$

$$5.) \int (5\sqrt{x} - 2\sqrt[3]{x}) dx$$

$$6.) \int \frac{4\sqrt{x} + 1}{x^2} dx$$

$$5.) \int (5\sqrt{x} - 2\sqrt[3]{x}) dx$$

$$\int (5x^{1/2} - 2x^{1/3}) dx$$

$$\frac{5x^{3/2}}{3/2} - \frac{2x^{4/3}}{4/3} + C$$

$$\frac{10}{3}x^{3/2} - \frac{3}{2}x^{4/3} + C$$

$$6.) \int \frac{4\sqrt{x} + 1}{x^2} dx$$

$$\int x^{-2} (4x^{1/2} + 1) dx$$

$$\int 4x^{-3/2} + x^{-2} dx$$

$$\frac{4x^{-1/2}}{-1/2} + \frac{x^{-1}}{-1} + C$$

$$-8x^{-1/2} - x^{-1} + C$$

Solve the differential equation.

$$7.) \frac{dy}{dx} = \frac{1}{2}x^2 - x + 4$$

$$y = \frac{1}{6}x^3 - \frac{1}{2}x^2 + 4x + C$$

$$8.) f''(x) = x + 3 \quad f'(1) = 2$$
$$f(1) = 4$$

$$f'(x) = \frac{1}{2}x^2 + 3x + C$$

$$2 = \frac{1}{2} + 3 + C$$

$$-\frac{1}{2} = C$$

$$f'(x) = \frac{1}{2}x^2 + 3x - \frac{3}{2}$$

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

$$4 = \frac{1}{6} + \frac{3}{2} - \frac{3}{2} + C \quad \left| \quad C = \frac{23}{6} \right.$$

$$f(x) = \frac{1}{6}x^3 + \frac{3}{2}x^2 - \frac{3}{2}x + \frac{23}{6}$$

$$9.) \int \csc^2 x dx \\ -\cot x + C$$

$$10.) \int \tan x \sec x dx \\ \sec x + C$$

$$11.) \int (1 - \cot x \csc x) dx \\ x + \csc x + C$$

$$12.) \int (2 \sin x - \cos x) dx \\ -2 \cos x - \sin x + C$$