(1) $\int \frac{5}{y^6}\,dy = -\frac{1}{y^5} + C$

(2) $\int x^2\sqrt{x}\,dx = \int x^{\frac{5}{2}}\,dx$

$= \frac{2}{7}x^{\frac{7}{2}} + C$

$= \frac{2}{7}x^3\sqrt{x} + C$

(3) $\int \frac{\sqrt{x}-1}{\sqrt[3]{x}}\,dx = \int (x^{\frac{1}{6}} - x^{-\frac{1}{3}})\,dx$

$= \frac{6}{7}x^{\frac{7}{6}} - \frac{3}{2}x^{\frac{2}{3}} + C$

$= \frac{6}{7}\sqrt[6]{x^7} - \frac{3}{2}\sqrt[3]{x^2} + C$

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

$= x^2 - x + 3\log|x| + \frac{1}{x} + C$

(5) $\int \sqrt{x}\left(1 + \frac{1}{\sqrt{x}}\right)^2 dx = \int \sqrt{x}\left(1 + \frac{2}{\sqrt{x}} + \frac{1}{x}\right)dx$

$= \int (\sqrt{x} + 2 + \frac{1}{\sqrt{x}})\,dx$

$= \frac{2}{3}\sqrt{x^3} + 2x + 2\sqrt{x} + C$

(6) $\int (5\sin x - 4\cos x)\,dx = -5\cos x - 4\sin x + C$

(7) $\int \left(\frac{1}{\tan x} + 2\right)\sin x\,dx = \int (\cos x + 2\sin x)\,dx$

$= \sin x - 2\cos x + C$

(8) $\int (2e^x - x^2)\,dx = 2e^x - \frac{1}{3}x^3 + C$

(9) $\int (5^x - e^x)\,dx$

$= \frac{5^x}{\log 5} - e^x + C$

(10) $\int \left(2e^x + \frac{3}{x}\right)dx$

$= 2e^x + 3\log|x| + C$