cálculo 1, stewart, vol 1, ed 5, cap 4.10

1 $\int 6x^2 - 8x + 3 \, dx = 6 \cdot \frac{x^3}{3} - 8 \cdot \frac{x^2}{2} + 3x + c = 2x^3 - 4x^2 + 3x + c$

3 $\int 1 - x^3 + 5x^5 - 3x^7 \, dx = x - \frac{x^4}{4} + 5\frac{x^6}{6} - 3\frac{x^8}{8} + c$

5 $\int 5x^{\frac{1}{4}} - 7x^{\frac{3}{4}} \, dx = 5 \cdot \frac{x^{\frac{5}{4}}}{\frac{5}{4}} - 7\frac{x^{\frac{7}{4}}}{\frac{7}{4}} + c = 4x^{\frac{5}{4}} - 4x^{\frac{7}{4}} + c$

7 $\int 6\sqrt{x} - \sqrt[6]{x} \, dx = 6\frac{x^{\frac{3}{2}}}{\frac{3}{2}} - \frac{x^{\frac{7}{6}}}{\frac{7}{6}} + c = 4x^{\frac{3}{2}} - \frac{6}{7}x^{\frac{7}{6}} + c$

9 $\int \frac{10}{x^9} \, dx = \int 10 \cdot x^{-9} \, dx = 10 \cdot \frac{x^{-8}}{-8} = -\frac{5}{4} \cdot \frac{1}{x^8} + c$

11 $\int \frac{x^2 + 3x^{\frac{1}{2}}}{x^2} \, dx = \int (x^2 + 3x^{\frac{1}{2}}) \cdot x^{-2} \, dx = \int 1 + 3x^{-\frac{3}{2}} \, dx = x + 3\frac{x^{-\frac{1}{2}}}{-\frac{1}{2}} + c$

$= x - 6x^{-\frac{1}{2}} + c$

13 $\int \cos x - 5 \operatorname{sen} x \, dx = \operatorname{sen} x - (5 \cdot - \cos x) + c = \operatorname{sen} x + 5\cos x + c$

15 $\int 2x + 5(1 - x^2)^{-\frac{1}{2}} \, dx = \int 2x + \frac{5}{\sqrt{1-x^2}} \, dx = \int 2x + 5 \cdot \frac{1}{\sqrt{1-x^2}} \, dx$

$= \cancel{2}\frac{x^2}{\cancel{2}} + 5 \cdot \operatorname{arcsen}(x) + c = x^2 + 5\operatorname{arcsen}(x) + c$

19 $f''(x) = 6x + 12x^2 \qquad \int f''(x) \, dx = f'(x)$

$\int 6x + 12x^2 \, dx = 6\frac{x^2}{2} + 12\frac{x^3}{3} + c = 3x^2 + 4x^3 + c_1$

$\int 3x^2 + 4x^3 + c_1 \, dx = 3\frac{x^3}{3} + 4\frac{x^4}{4} + c_1 x + c_2 = x^3 + x^4 + c_1 x + c_2$

23 $\int e^t \, dx = e^t + c_1$

$\int e^t + c_1 \, dx = e^t + c_1 x + c_2$

$\int e^t + c_1 x + c_2 \, dx = e^t + c_1 \cdot \frac{x^2}{2} + c_2 x + c_3$

25 $f'(x) = 1 - 6x$ $\qquad \int f'(x)\,dx = f(x)$

$\int 1 - 6x \, dx = x - 6\frac{x^2}{2} + c = x - 3x^2 + c$

$f(0) = c = 8 \qquad f(x) = x - 3x^2 + 8$

27 $\int \sqrt{x} \cdot (6 + 5x)\, dx = \int 6\sqrt{x} + 5x\sqrt{x}\, dx = \int 6x^{\frac{1}{2}} + 5x^{\frac{3}{2}}\, dx$

$f(x) = 6 \cdot \frac{x^{\frac{3}{2}}}{\frac{3}{2}} + 5\frac{x^{\frac{5}{2}}}{\frac{5}{2}} + c = 4x^{\frac{3}{2}} + 2x^{\frac{5}{2}} + c$

$f(1) = 10 = 4 \cdot 1 + 2 \cdot 1 + c = 6 + c \qquad c = 4$

29 $\int 2\cos x + \sec^2 x\, dx = 2\,\text{sen}\, x + \text{tg}\, x + c$

$f(\frac{\pi}{3}) = 2 \cdot \text{sen}\,(\frac{\pi}{3}) + \text{tg}\,(\frac{\pi}{3}) + c = 4$

$= \cancel{2} \cdot \frac{\sqrt{3}}{\cancel{2}} + \sqrt{3} + c = 4 \qquad c = 4 - 2\sqrt{3}$

31 $\int \frac{2}{x}\, dx = \int 2 \cdot \frac{1}{x}\, dx = 2 \cdot \ln(|x|) + c \quad , \quad x < 0$

$2 \cdot \ln(-x) + c$

$f(-1) = 2\ln(-(-1)) + c = 2 \cdot \ln 1 + c = c = 7$

$f(x) = 2\ln(-x) + 7$

33 $\int 24x^2 + 2x + 10\, dx = 24\frac{x^3}{3} + 2\frac{x^2}{2} + 10x + c_1$

$f'(x) = 8x^3 + x^2 + 10x + c_1 = 8x^3 + x^2 + 10x - 14$

$f'(1) = 8 + 1 + 10 + c_1 = 3 \qquad c = -22$

$\int f'(x)\, dx = 8\frac{x^4}{4} + \frac{x^3}{3} + 10\frac{x^2}{2} - 22x + c_1$

$f(x) = 2x^4 + \frac{x^3}{3} + 5x^2 - 22x + c$

$f(1) = 2 + \frac{1}{3} + 5 - 22 + c = 5 \qquad c = \frac{59}{3}$

35 $\int \operatorname{sen} x + \cos x \, dx = -\cos x + \operatorname{sen} x + c = f'(x)$

$f'(0) = -1 + 0 + c = 4 \qquad c = 5$

$\int -\cos x + \operatorname{sen} x + 5 \, dx = -\operatorname{sen} x - \cos x + 5x + c = f(x)$

$f(0) = -0 - 1 + 5.0 + c = 3 \qquad -1 + c = 3 \qquad c = 4$

$f(x) = -\operatorname{sen} x - \cos x + 5x + 4$

41 $\int x^{-2} \, dx = -x^{-1} + c_1 = f'(x)$

$\int -x^{-1} + c_1 \, dx = \int -\frac{1}{x} + c_1 \, dx = -\ln(|x|) + c_1 + c_2$