13. $f'(x) = 8x^3 + 3$ $\quad f(1) = 8$

$f(x) = \int f'(x)\,dx$ $\quad$ $x = 1$ $\quad$ $y = 8$

$= \int (8x^3 + 3)\,dx$

$f(x) = \frac{8x^4}{4} + 3x + C$

$f(x) = 2x^4 + 3x + C$ ←

$8 = 2(1)^4 + 3(1) + C$

$8 = 5 + C$

$8 - 5 = C$

$3 = C$

$f(x) = 2x^4 + 3x + C$ BECOMES

$f(x) = 2x^4 + 3x + 3$

14. $f''(x) = x^3 - 1$ $\quad f'(1) = 3$ $\quad f(3) = -2$

$x = 1$ $\quad y = 3$ $\quad x = 3$ $\quad y = -2$

$f'(x) = \int f''(x)\,dx$

$= \int (x^3 - 1)\,dx$

$f'(x) = \frac{1}{4}x^4 - x + C$

$3 = \frac{1}{4}(1)^4 - (1) + C$

$3 = \frac{1}{4} - 1 + C$

$3 + 1 - \frac{1}{4} = C$

$4 - \frac{1}{4} = C$

$\frac{15}{4} = C$

$f'(x) = \frac{1}{4}x^4 - x + \frac{15}{4}$

$f(x) = \int f'(x)\,dx$

$f(x) = \int \left(\frac{1}{4}x^4 - x + \frac{15}{4}\right)dx$

$f(x) = \frac{1}{4}\cdot\frac{1}{5}x^5 - \frac{1}{2}x^2 + \frac{15}{4}x + C$

$-2 = \frac{1}{20}(3)^5 - \frac{1}{2}(3)^2 + \frac{15}{4}(3) + C$

$-2 = \frac{243}{20} - \frac{9}{2} + \frac{45}{4} + C$

$-2 = \frac{243}{20} - \frac{90}{20} + \frac{225}{20} + C$

$-2 = \frac{378}{20} + C$

$-2 - \frac{378}{20} = C$

$-\frac{418}{20} = C$

$-\frac{209}{10} = C$

$f(x) = \frac{1}{20}x^5 - \frac{1}{2}x^2 + \frac{15}{4}x - \frac{209}{10}$

243
225
468
- 90
378
90
468