

Examen

1. $\int_{-2}^{-2} x^2 dx$

$$\int x^2 dx$$

$$\frac{x^{2+1}}{2+1} = \frac{x^3}{3}$$

$$\frac{x^3}{3} \Big|_{-2}^2 = \frac{2^3}{3} - \frac{(-2)^3}{3} = \frac{16}{3}$$

2. $\int_{-3}^3 (2x^2 + 3) dx$

$$\int 2x^2 + 3 dx$$

$$\int 2x^2 dx + \int 3 dx$$

$$\left(\frac{2x^3}{3} + 3x \right) \Big|_{-3}^3$$

$$\frac{2 \times 3^3}{3} + 3 \times 3 - \left(\frac{2 \times (-3)^3}{3} + 3 \times (-3) \right) = 54$$

$$3. \int_{-2}^3 x^4 (x^3 - x) dx$$

$$\int x^4 (x^3 - x) dx = x^4 \cdot x^3 - x^4 \cdot x$$
$$x^7 - x^5$$

$$\int x^7 - x^5 dx$$

$$\int x^7 dx - \int x^5 dx$$

$$\int x^7 dx = \frac{x^{7+1}}{7+1} = \frac{x^8}{8}$$

$$\frac{x^8}{8} - \int x^5 dx$$

$$- \int x^5 dx$$
$$= \frac{x^{5+1}}{5+1}$$
$$= -\frac{x^6}{6}$$

$$\left(\frac{x^8}{8} - \frac{x^6}{6} \right) \Big|_{-3}^3$$

$$\frac{3^8}{8} - \frac{3^6}{6} - \left(\frac{(-3)^8}{8} - \frac{(-3)^6}{6} \right) = 0$$

$$4. f(x) = 2x + 4$$

$$f(3) = x + 8$$

d. Posición en sus primeras horas

$$\int_0^2 2x + 4 dx$$

$$\left. \frac{2x^2}{2} + 4x \right|_0^2$$

$$4 + 8 = 12$$

$$\int_0^2 f(x) dx = 12$$

Toda la felicidad en la tierra está, amigo, en la lucha.

F. Nietzsche

5. En las últimas 4 horas

$$\int_8^{12} 6(x) dx$$

$$\int_8^{12} (x+8) dx$$

$$\left. \frac{x^2}{2} + 8x \right|_8^{12}$$

$$\left(\frac{12^2}{2} + 8 \cdot 12 \right) - \left(\frac{8^2}{2} + 8 \cdot 8 \right)$$

$$168 - 96$$

$$\int_8^{12} 6(x) dx = 72$$

6. $\int_{-2}^0 -\frac{x^2}{4} + x + 3 dx$

$$\int_a^b f(x) - g(x) dx$$

$$\int_{-2}^0 \left[9 - \left(\frac{x}{2}\right)^2 - (6-x) \right] dx = \int_{-2}^0 \left[3 - \frac{x^2}{4} + x \right] dx$$

$$= \left[3x - \frac{x^3}{12} + \frac{x^2}{2} \right] \Big|_{-2}^0 = \frac{64}{3}$$