

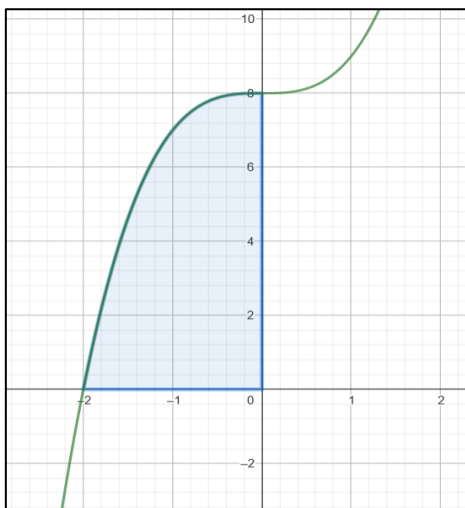
Lösung zu den Übungen zu einfachen Flächenberechnungen

Gesucht ist die Fläche A der markierten Fläche.

1. $f(x) = x^3 + 8$

$$A = \int_{-2}^0 f(x) dx = [0,25x^4 + 8x]_{-2}^0$$

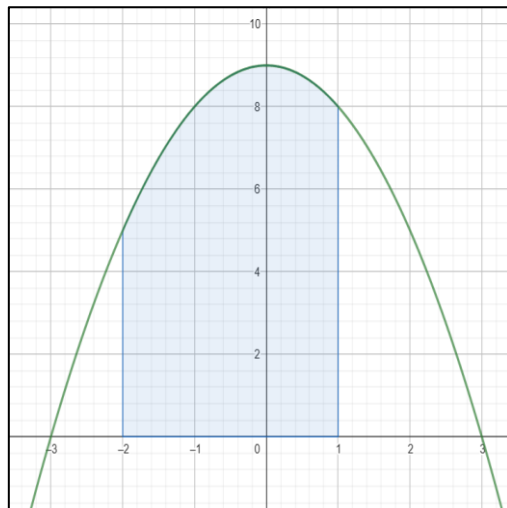
$$= 0 - (4 - 16) = 12$$



3. $f(x) = -x^2 + 9$

$$A = \int_{-2}^1 f(x) dx = \left[-\frac{1}{3}x^3 + 9x\right]_{-2}^1$$

$$= -\frac{1}{3} + 9 - \left(\frac{8}{3} - 18\right) = -3 + 27 = 24$$



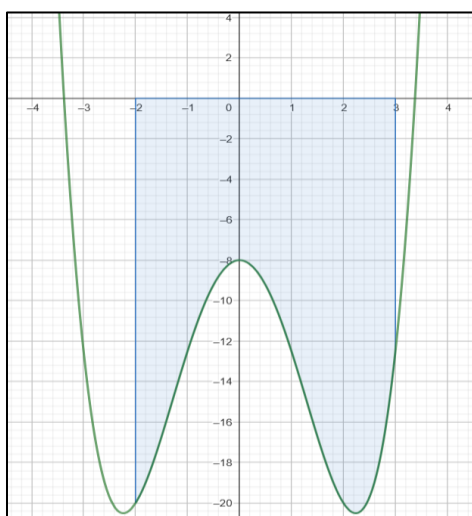
2. $f(x) = 0,5x^4 - 5x^2 - 8$

$$A = \left| \int_{-2}^3 f(x) dx \right|$$

$$= \left| \left[0,1x^5 - \frac{5}{3}x^3 - 8x \right]_{-2}^3 \right|$$

$$= \left| (24,3 - 45 - 24) - \left(-3,2 + \frac{40}{3} + 16\right) \right|$$

$$= |-44,7 - 26,1\bar{3}| = |-70,8\bar{3}| = 70,8\bar{3}$$



4. $f(x) = 0,2x^3 - x^2 - 2,4x + 7,2$

$$A = \left| \int_2^6 f(x) dx \right|$$

$$= \left| \left[0,05x^4 - \frac{1}{3}x^3 - 1,2x^2 + 7,2x \right]_2^6 \right|$$

$$= |-7,2 - 7,7\bar{3}| = |-14,9\bar{3}| = 14,9\bar{3}$$

