Integration

1. Calculate the following integrals.

   a) $\int_0^2 (\frac{1}{2}x + 4)^3 \mathrm{d}x$

   b) $\int_1^4 x\sqrt{x}\,\mathrm{d}x$

2. Calculate the area enclosing the given function in the given interval with the x-axis.

   a) $f(x) = -2, \qquad x \in [-1, 1]$

   b) $f(x) = x^2 + 5x + 4, \qquad x \in [-4, 1],$

3. Calculate the area enclosed by the graphs of $g(x) = -x^2 + 4$ and $h(x) = -2x + 1$.