1(2) Estimate $\int_1^2 \frac{1}{x} \, dx$ with upper and lower sums of three rectangles of equal width.

The rectangle endpoints are $1 = \frac{3}{3}, \frac{4}{3}, \frac{5}{3}, \frac{6}{3} = 2$. The rectangle widths are $\frac{1}{3}$, the values of $\frac{1}{x}$ on these points are the reciprocals $1 = \frac{3}{3}, \frac{3}{4}, \frac{3}{5}, \frac{3}{6} = \frac{1}{2}$. Leave answer as an unsimplified sum of products e.g. $\frac{2}{3}(\frac{1}{4}) + \frac{3}{5}(\frac{1}{4}) + \frac{2}{5}(\frac{1}{4})$.

Upper sum: unsimplified sum of three products

Lower sum: unsimplified sum of three products

12(2) $\int_{-3}^{0} g(t) \, dt = \sqrt{2}$

(a) $\int_{0}^{-3} g(u) \, du = 3$ symbols, checksum=2

(d) $\int_{-3}^{0} \frac{g(r)}{\sqrt{2}} \, dr =$ positive digit

18(2) Draw the graph to find the area. $\int_{-4}^{0} \sqrt{16 - x^2} \, dx =$ 2 symbols, checksum=4