

1. Evaluate each of the following integrals.

(a)
$$\int_{-3}^5 \frac{1}{5x+63} dx$$

(f)
$$\int (1 + \sec(x))^2 dx$$

(b)
$$\int \frac{5x}{x^2+4} dx$$

(g)
$$\int 3^{4x+2} dx$$

(c)
$$\int_0^2 xe^{-x^2} dx$$

(h)
$$\int \frac{2^{\frac{1}{x}}}{x^2} dx$$

(d)
$$\int \frac{\ln(x)}{x} dx$$

(i)
$$\int \left(\frac{1}{5}\right)^x dx$$

(e)
$$\int \frac{4e^{\sqrt{x+5}}}{\sqrt{x+5}} dx$$

(j)
$$\int x^{\frac{1}{5}} dx$$

2. Find the derivative of each of the following functions.

(a) $f(x) = 7^{x^2-3x+2}$

(c) $f(x) = x \log(x + 1)$

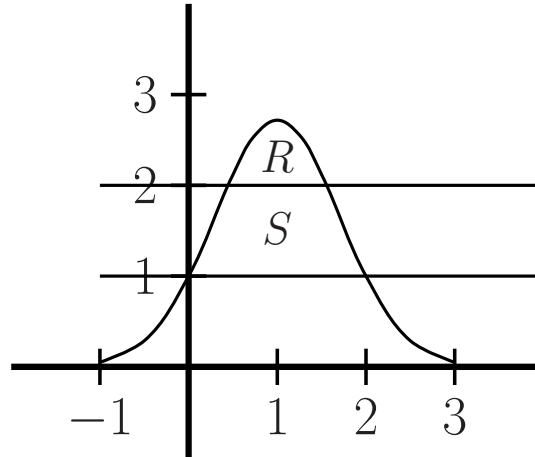
(b) $f(x) = (x + 3)2^x$

(d) $f(x) = 2^x \log_2 \left| \frac{x^2 + 2x + 2}{2} \right|$

3. Do #12 in section 7.6 (page 422). Round to the nearest tenth of a gram.

4. Do #18 in section 7.6 (page 422).

5. (From the 2007 AP Calculus AB exam) Let R be the region bounded by the graph of $y = e^{2x-x^2}$ and the horizontal line $y = 2$, and let S be the region bounded by the graph of $y = e^{2x-x^2}$ and the horizontal lines $y = 1$ and $y = 2$, as shown below.



- (a) Set up, but do not evaluate, an integral expression that gives the area of R .
- (b) Set up, but do not evaluate, an integral expression that gives the area of S .
- (c) Set up, but do not evaluate, an integral expression that gives the volume of the solid generated when R is rotated about the horizontal line $y = 1$.