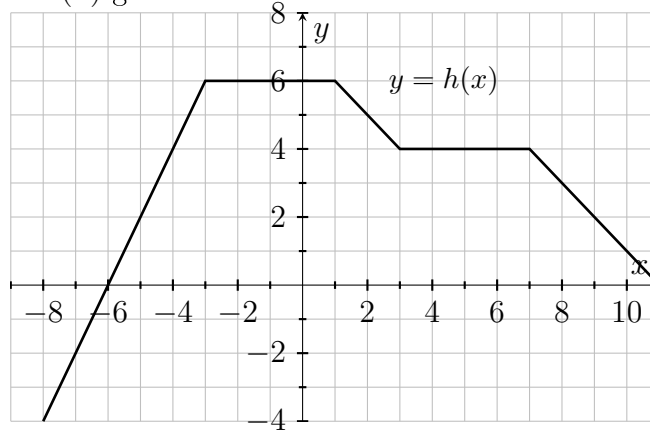


1. (2ea) Use the graph of $h(x)$ given below to determine the values of the definite integrals.



(a) $\int_{-8}^{-6} h(x) dx$

(b) $\int_3^7 h'(x) dx$

(c) $\int_{-7}^{-3} h'(x) dx$

(d) $\int_8^{10} h''(x) dx$

2. (1,1,2,2) A freshly brewed cup of coffee is initially at a temperature of 200°F . The coffee's temperature is changing at a rate of $r(t) = Ce^{kt}$ $^{\circ}\text{F}$ per minute, with t in minutes, where C and k are constants.

(a) What are the units of $r(t)$?

(b) If $T'(t) = r(t)$, what are the units of $T(t)$?

(c) What are the units of $\int_0^{30} r(t) dt$?

(d) Which of the following expressions makes the most practical sense? Circle your choice, and give a practical interpretation of what the expression means in terms of the coffee's temperature.

$$\int_0^{60} r(t) dt = 130$$

$$\int_0^{60} r(t) dt = -130$$

3. (3) Given $g(x) = x^2 \cos(x^2)$, use the Fundamental Theorem of Calculus to find $\int_{-\frac{\sqrt{\pi}}{2}}^{\sqrt{2\pi}} g'(x) dx$.

4. (2ea) Suppose $\int_1^5 f(x) dx = 3$, and $\int_1^5 g(t) dt = 7$. Evaluate the definite integrals below. Use correct notation to say what you mean.

(a) $\int_1^5 (f(x) + 2g(x)) dx$

(b) $\int_1^5 f(z) dz - \int_5^1 g(t) dt$