Lesson 31: The Fundamental Theorem of Calculus

1. Evaluate $\int_{-2}^{-1} \frac{1}{x}\, dx$.
2. Evaluate $\int_{3}^{8} \sqrt[3]{x}\, dx$.
3. Evaluate $\int_{0}^{50} -10x + 10\, dx$.
4. Evaluate $\int_{10}^{20} e^x - 16\, dx$.
5. Evaluate $\int_{0}^{2\pi} -2\sin x\, dx$.
6. Find the area bounded by the curves $y = 0$, $y = 2x$, $x = 1$, $x = 2$.
7. Find the area bounded by the curves $y = 0$, $y = -2x + 4$, $x = -8$, $x = -5$.
8. Find the area bounded by the curves $y = 0$, $y = (x+1)^2$, $x = 1$, and $x = 4$.

Answers:

1. $-\ln(2)$
2. $12 - \dfrac{9\sqrt[3]{3}}{4}$
3. $-12,000$
4. $e^{20} - e^{10} - 160$
5. 0
6. 3
7. 51
8. 39