NAME _____ DATE _____ PERIOD _____

Practice

The Fundamental Theorem of Calculus

Evaluate each indefinite integral.

1. $\int 8\,dx$

2. $\int (2x^3 + 6x)\,dx$

3. $\int (-6x^5 - 2x^2 + 5x)\,dx$

4. $\int (9x^2 + 12x - 9)\,dx$

Evaluate each definite integral.

5. $\int_2^5 2x\,dx$

6. $\int_{-5}^{-1} (-4x^3 - 3x^2)\,dx$

7. $\int_{-2}^{1} (1 - x)(x + 3)\,dx$

8. $\int_{-1}^{2} (x + 1)^3\,dx$

Find the area between each curve and the x-axis for the given interval.

9. $y = x^2 + 4x + 5$ from $x = 1$ to $x = 4$

10. $y = x + 1$ from $x = -1$ to $x = 2$

11. $y = x^3 + 1$ from $x = -1$ to $x = 3$

12. $y = x^2 + 1$ from $x = 0$ to $x = 3$

13. ***Physics*** The work in foot-pounds required to compress a certain spring a distance of ℓ feet from its natural length is given by $W = \int_0^{\ell} 2x\,dx$. How much work is required to compress the spring 6 inches from its natural length?