Problems for Gateway #2: Antiderivatives of Polynomial Functions

1. Calculate the antiderivative of: $f(x) = 3 \cdot x^2 + x$.

2. Calculate the antiderivative of: $f(x) = x^4 + 2 \cdot x^2 + 1$.

3. Calculate the antiderivative of: $f(x) = 3 \cdot x^3 + 3 \cdot x + 3$.

4. Calculate the antiderivative of: $f(x) = x^2 + 9 \cdot x + 3$.

5. Calculate the antiderivative of: $f(x) = x + 9 \cdot x^4 + 2$.

6. Calculate the antiderivative of: $f(x) = 8 \cdot x^3 + 2 \cdot x^2 + 4$.

7. Calculate the antiderivative of: $f(x) = 6 \cdot x^2 + 9 \cdot x^4$.

8. Calculate the antiderivative of: $f(x) = 3 \cdot x^2 + 4 \cdot x^3$.

9. Calculate the antiderivative of: $f(x) = 2 \cdot x^2 + 3 \cdot x^3 + 4 \cdot x^4$.

10. Calculate the antiderivative of: $f(x) = 4 \cdot x^2 + 8 \cdot x^7 + 2$.

Answers

1. $F(x) = x^3 + \frac{1}{2}x^2 + C$
2. $F(x) = \frac{1}{5}x^5 + \frac{2}{3}x^3 + x + C$
3. $F(x) = \frac{3}{4}x^4 + \frac{3}{2}x^2 + 3x + C$
4. $F(x) = \frac{1}{3}x^3 + \frac{9}{2}x^2 + 3x + C$
5. $F(x) = \frac{1}{2}x^2 + \frac{9}{5}x^5 + 2x + C$
6. $F(x) = \frac{8}{4}x^4 + \frac{2}{3}x^3 + 4x + C$
7. $F(x) = \frac{6}{3}x^3 + \frac{9}{5}x^5 + C$
8. $F(x) = x^3 + x^4 + C$
9. $F(x) = \frac{2}{3}x^3 + \frac{3}{4}x^4 + \frac{4}{5}x^5 + C$
10. $F(x) = \frac{4}{3}x^3 + x^8 + 2x + C$