

1. Differentiate and Simplify: $f(x) = -3x^5 + 7x^3 - 8x + \sqrt{5}$
2. Differentiate and Simplify: $f(x) = 4x + \frac{6}{\sqrt{x}} + \frac{3}{x^2} - \frac{5}{x} + 4$
3. Differentiate and Simplify: $f(x) = (7x - 5)(x^2 - x)$
4. Differentiate and Simplify: $f(x) = \frac{3x^2 - 5}{2x + 3}$
5. Find the equation of the tangent line to the curve $f(x) = 4x^2 + 5x + 2$ at $x = 1$.
6. Use calculus to find where the maximum or minimum occurs on the graph of $y = x^2 - 5x + 3$.
7. Differentiate and simplify: $f(x) = \sqrt{3x^4 + 2x}$
8. Differentiate and simplify: $f(x) = 4x^3(2x - 5)^4$
9. Find the second derivative: $f(x) = 4x^4 - 2x^2 + 4x + 5 + \frac{2}{x^2} - 8\sqrt{x}$

ANSWERS

1. $-15x^4 + 21x^2 - 8$
2. $4 - \frac{3}{\sqrt{x^3}} - \frac{6}{x^3} + \frac{5}{x^2}$
3. $21x^2 - 24x + 5$
4. $\frac{6x^2 + 18x + 10}{(2x + 3)^2}$
5. $y = 13x - 2$
6. Minimum of $-3\frac{1}{4}$ at $x = 2\frac{1}{2}$
7. $\frac{6x^3 + 1}{\sqrt{3x^4 + 2x}}$
8. $4x^2(2x - 5)^3(14x - 15)$
9. $48x^2 - 4 + \frac{12}{x^4} + \frac{2}{\sqrt{x^3}}$