

Name: _____

Higher Order Derivatives

Exercise 1: For each of the following functions $f(x)$, find $f'(x)$ and $f''(x)$.

1) $f(x) = 3x^4 - 4x^2 + 7x - 11$

2) $f(x) = \frac{3x+1}{2x-1}$

3) $f(x) = x^3 \cos(4x)$

4) $f(x) = \sin^4 x$

5) $f(x) = 6x^7 + 3x^4 + 7$

6) $f(x) = -3x^{11} + 5x^9 + 7x$

7) $f(x) = \sqrt{3}x^4 + \sqrt{2}x^3 + 5x - 2$

8) $f(x) = 2\sqrt{5}x^4 - \sqrt{2}x^2 + \sqrt{32}$

9) $f(x) = \frac{x-1}{x+2}$

10) $f(x) = \frac{x}{x-3}$

11) $f(x) = \sin 3x \cos 2x$

12) $f(x) = \sin^2 x + 3 \cos x$

13) $f(x) = xe^x + 3e^x$

14) $f(x) = \sin xe^x + 2 \ln x$

Exercise 2: Use implicit differentiation to find y' and y'' in terms of x and y if $x^2 + 6xy + y^2 = 8$. Write your answer in simplest form.