

I. Graph the following piecewise functions and determine whether they are smooth.

$$1. f(x) = \begin{cases} 4x+1 & x > 1 \\ x^2+4 & x \leq 1 \end{cases}$$

$$2. f(x) = \begin{cases} 3x-2 & x \leq 2 \\ -x+6 & x > 2 \end{cases}$$

$$3. f(x) = \begin{cases} 2x^2+1 & x > 1 \\ 3x^2 & x \leq 1 \end{cases}$$

$$4. f(x) = \begin{cases} 2x+3 & x < 1 \\ x^2+4 & x \geq 1 \end{cases}$$

II. Remove the absolute value symbols

$$1. f(x) = |8 - 2x| \qquad 2. f(x) = |-3x + 5|$$

$$3. f(x) = |x^2 - 3x - 10| \qquad 4. f(x) = |x^2 + 4x - 7|$$

III. Find $f^{-1}(x)$.

$$1. f(x) = 2x^3 - 8 \qquad 2. f(x) = \sqrt[3]{3x+5}$$

$$3. f(x) = \frac{2x+5}{x-1} \qquad 4. f(x) = \frac{x+4}{9-x}$$