Name _____ KEY _____

Instructions: Show all work. Use exact answers unless otherwise asked to round.

1. Write the function $f(x) = |x|$ after it has undergone the following transformations in the given order:
   a. Horizontal shift to the right of 2
   b. Vertical reflection
   c. Vertical stretch by 3
   d. Vertical shift down by 5

   $|x-2|$
   $-|x-2|$
   $-3|x-2|$
   $g(x) = -3|x-2|-5$

2. Find the inverse function $f^{-1}(x)$ for the function $f(x) = \frac{2x-3}{x+1}$. State the domain and range of each.

   $x = \frac{2y-3}{y+1}$

   $xy + x = 2y - 3$

   $xy - 2y = -x - 3$

   $y(x-2) = -x-3$

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

3. Simplify, and write in standard form.
   a. $(-4 - 8i)(3 + i)$

   $-12 - 4i - 24i - 8i^2$
   $-12 - 28i + 8$
   $-4 - 28i$

   b. $\frac{3-4i}{4+3i} \cdot \frac{4-3i}{4-3i}$, $\frac{12 - 9i - 16i + 12i^2}{16 + 9}$ $=$ $\frac{12 - 25i - 12}{25}$ $=$ $-i$

4. The function $f(x) = x^2 - 4x + 4$ is not a one-to-one function. How would you restrict the domain to make it one-one-one? What is its inverse? $f(x) = (x-2)^2$

   restrict to $[2, \infty)$

   $x = (y-2)^2$
   $\sqrt{x} = y - 2$
   $\sqrt{x} + 2 = y = f^{-}(x)$