Directions: Please answer the following questions and make sure your answer are legible. If you don’t show work and/or I can’t follow it, I won’t give partial credit. You may not use a calculator (or any other technology) on this quiz. Good Luck.

1. (4 points) For the function pictured:
   (a) On what interval(s) is the function increasing?
   (b) Is the function even, odd, or neither?
   (c) Find the absolute maximum of \( f(x) \) (if it exists)
   (d) Find the absolute minimum of \( f(x) \) (if it exists)

2. (5 points) Sketch the following function. Be sure to label at least 3 points on the graph.

\[
f(x) = \begin{cases} 
2 & \text{if } -3 \leq x < -1 \\
|x| & \text{if } -1 \leq x < 2
\end{cases}
\]
3. (6 points) Graph the following function using the techniques of shifting, compression, stretching and/or reflecting. Show and label all stages for partial credit. Be sure to show at least 3 key points.

\[ f(x) = (2x - 1)^2 + 3 \]

Start: \( y = x^2 \)
- replace \( x \) by \( 2x \)
  \[ y = (2x)^2 \]
- replace \( x \) by \( x - \frac{1}{2} \)
  \[ y = (2(x - \frac{1}{2}))^2 \]
- add 3 to outside
  \[ y = (2x - 1)^2 + 3 \]

I \( \rightarrow \) II multiply each x-coord by \( \frac{1}{2} \)
II \( \rightarrow \) III add \( \frac{1}{2} \) to each x-coord
III \( \rightarrow \) IV add 3 to each y-coord

This is what you think to yourself, you do not need to write it.