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. (7 points) A circle is inscribed in a square (See Below). Express the Area of the circle $A$ as a function of the perimeter of the square $p$.

   \[
   A_{\text{circle}} = \pi r^2 \quad \leftarrow \text{you need to know formula for area of a circle!}
   \]

   \[
   \text{[this has } r \text{ as the variable; we need } p \text{ as the variable]}
   \]

   \[
   * \text{ per square } = 4s
   \]

   \[
   S = 2r
   \]

   \[
   \text{so } p = 4(2r) = 8r
   \]

   \[
   \frac{p}{8} = r
   \]

   \[
   A(p) = \pi \left( \frac{p}{8} \right)^2
   \]

2. (4 points) Refer to the given figure:
   (a) Solve $g(x) = f(x)$.

   \[
   x = 2
   \]

   (b) Solve the inequality $g(x) \leq f(x) < h(x)$. Answer in interval notation.

   \[
   \text{There is a question on the back}
   \]
3. (4 points) Write \( f(x) = 2x^2 + 12x + 5 \) in \( f(x) = a(x - h)^2 + k \) format

\[
\begin{align*}
  f(x) &= 2 \left[ x^2 + 6x \right] + 5 \\
  \text{OR} \\
  f(x) &= 2 \left[ x^2 + 6x + 9 \right] + 5 - 9 + 5 \\
  f(x) &= 2 \left[ (x + 3)^2 \right] + 5 \\
  f(x) &= 2 \left[ (x + 3)^2 \right] - 11 + 5 \\
  \underline{f(x) = 2(x + 3)^2 - 13}
\end{align*}
\]