Problem 1  Consider two quantities, \( u \) and \( v \), which are related to each other with the following table:

\[
\begin{array}{c|ccccccc}
 x & 4 & -2 & 0 & 1 & 6 & 7 & 3 \\
f(x) & 4 & 2 & 3 & 6 & 8 & 4 & 2 \\
\end{array}
\]

\[
\begin{array}{c|ccccccc}
 x & 2 & 6 & 4 & 1 & 8 & 0 & 3 \\
g(x) & 3 & 2 & 5 & 6 & -1 & 4 & 1 \\
\end{array}
\]

Determine the following:

(a) What is \( f(g(0)) \)?

(b) What is \( g(f(0)) \)?

(c) What is \( f(f(1)) \)?

(d) What is \( f(g^{-1}(1)) \)?
**Problem 2** Determine where the lines described by \( a(x) = \frac{3}{4}x - 2 \) and \( b(x) = \frac{-5}{4}x + 4 \) intersect and write your answer as a coordinate pair. Are these two lines perpendicular?

**Problem 3** What is the range of \( h(z) = -\sqrt{z + 2} + 1 \)? Write your answer in inequality notation.
Problem 4  Let $h(s) = \frac{|2s^2-1|}{s^2-1}$ and $g(s) = \sqrt{s+1}$.

(a) What is the domain of $h(s)$? Write your answer in inequality or interval notation.

(b) What is the domain of $g(s)$? Write your answer in inequality or interval notation.

(c) Determine a formula for $(h \circ g)(s)$. 
(d) What is the domain of \((h \circ g)(s)\)? Write your answer in inequality or interval notation.

**Problem 5**  Consider the graph of \(r(k)\) below. Sketch the graph of \(r(2k + 4) - 2\).
**Problem 6**  Is \( f(t) = \frac{3}{t^2 - 1} \) a one-to-one function? Why or why not?

**Problem 7**  Solve the inequality \(|3x + 8| < 4\) for \(x\). Write your answer in inequality and interval notation.
Problem 8  Which of the following could be the graph of $r(y) = 2y^8 - 3y^6 + y^2$?

Problem 9  Let $f(x) = -(x + 2)^2 - 3$

(a) Sketch $f(x)$
(b) Describe the region where $f$ is non-decreasing using inequality notation

(c) Restricting the domain of $f$ to the region in part (b), determine the formula for $f^{-1}(x)$. 