Write your Name, PID, and Discussion Section, on the cover of your bluebook.
• No calculators or other electronic devices are allowed during this exam.
• You may use one page of notes front and back, but no books or other materials.
• Write your solutions in your bluebook clearly and in order.
• Follow any instructions written on the board.
• Show all of your work. No credit will be given for unsupported answers.

(0) (1pt) Carefully read and follow the above instructions.

(1) Let \( f(x) = \frac{x+3}{2} \) and \( g(x) = 2x + c \).
   (a) (2pts) Find \( c \) such that \( f \circ g = g \circ f \).
   (b) (2pts) Find a function \( h(x) \) defined by transforming \( f \) first by shifting it to the right by 3 horizontally, then stretching it vertically by 2.

(2) (4pts) Find the equation of the line that is perpendicular to the line \(-3x + 6y = 18\) and contains the point \((2,1)\).

(3) (4pts) Find the radius and center of the circle defined by the equation \(x^2 + 6x + y^2 - 8y = 11\).

(4) Let \( f(x) = \frac{x-3}{x+3} \).
   (a) (2pts) Find \( f^{-1} \).
   (b) (1pt) Find the domain of \( f \).
   (c) (1pt) Find the range of \( f \).
   (d) (1pt) Find the domain of \( f^{-1} \).
   (e) (1pt) Find the range of \( f^{-1} \).

(5) (4pts) Find the largest domain for which \( f(x) = 2x^2 + 8x - 10 \) is an increasing function.

(6) (4pts) Use the properties of logarithms to determine the value of \( \log_4(32) \).