Math 115 **Exam 2** **October 17, 2014**

Name _____

- Do not open this test until I say start.
- Turn off all electronic devices and put away all items except a pen/pencil and an eraser.
- No calculators allowed.
- You must show sufficient work to justify each answer.
- Quit working and close this test booklet when I say stop.

1. (14 points) Let $f(x) = \dfrac{x}{x+3}$ and $g(x) = \sqrt{2x-1}$

   (a) Find $f^{-1}(x)$.

   (b) Find $\dfrac{(f \circ f)(-2)}{(f \circ g)(25)}$.

2. (6 points) Find the equation of the line perpendicular to $3x + 2y = 1$ passing through the point $(3, -1)$

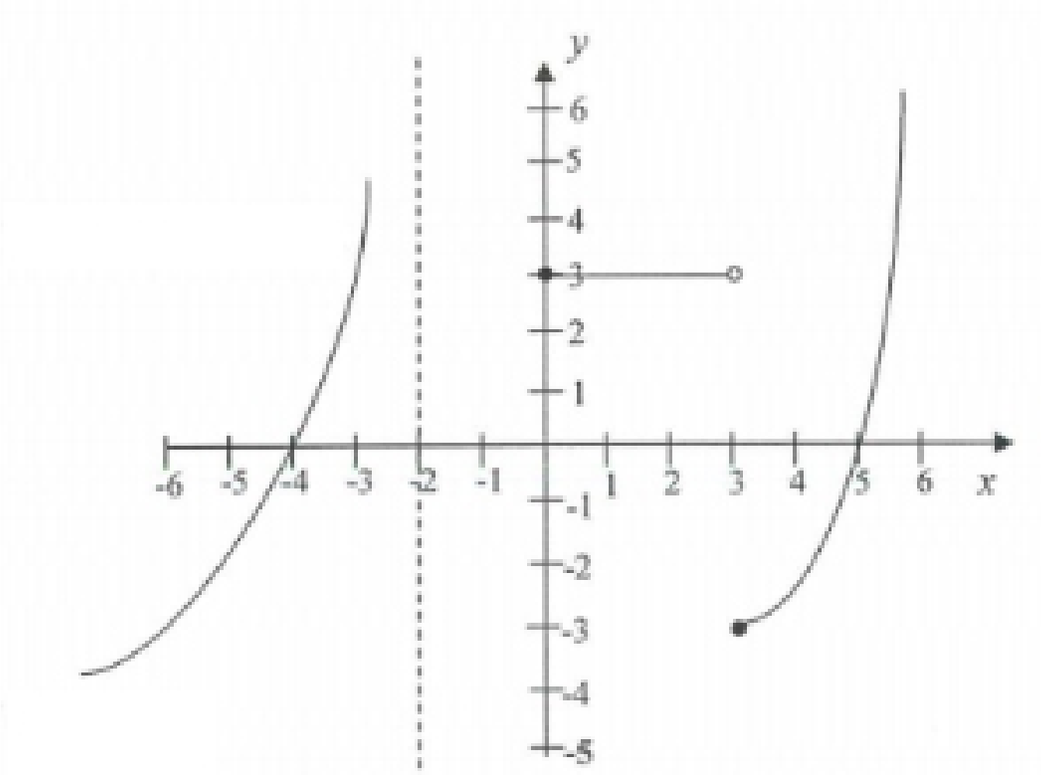
3. (8 points) The graph of a function, g, is shown here.

(a) What is the domain of g?

(b) What is the range of g?

(c) What is $g(3)$?

(d) Find all numbers x such that $g(x) = 0$.



4. (18 points) Determine the limit of the sequence

(a) $p_n = \dfrac{3 - 2n^2}{3n^3 - n + 2}$

(b) $b_n = \left(-\dfrac{6}{7}\right)^{n+2}$

(c) $h(n) = \dfrac{\sqrt[3]{3n + 9n^6}}{n^2 + 71}$