HOMEWORK 6 - MATH 140

DUE DATE: Monday, October 17
INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. One part of each homework problem will be chosen at random and graded. Each question is worth 1 point. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Let $f(x) = \frac{1}{x+3}$ and $g(x) = -\frac{2}{x}$. Find the domain of f and the domain of g. Then find a formula for $(g \circ f)(x)$ and finally find the domain of $g \circ f$.

2. Let $f(x) = x^2 + 4$ and $g(x) = \sqrt{x-2}$. Find the domain of f and the domain of g. Then find a formula for $(g \circ f)(x)$ and finally find the domain of $g \circ f$.

3. Find the inverse function f^{-1} of $f(x) = \frac{2x-3}{x+4}$. Then find the domain of f and the range of f.

4. Graph the function $f(x) = 3^{-x}$. Then use transformations to graph the function $g(x) = 3^{2-x} + 5$. Find the range of g.

5. (a) Solve the equation $5^{1-2x} = \frac{1}{5}$
   (b) Solve the equation $(e^4)^x e^{x^2} = e^{12}$
   (c) If $5^{-x} = 3$ what is 5^{3x} equal to?

6. Find the domains of the functions $f(x) = \log_5 \frac{x-3}{5+2x}$ and $g(x) = \log_{2/3}(x^2 - 7x + 10)$.

7. Graph the function $f(x) = \log_2 x$. Then use transformations to graph the function $g(x) = -\log_2(x-1) + 3$. Find the domain of g.

8. Solve the following equations:
   (a) $\log_2(4x - 5) = 2$
   (b) $\log_6 36 = 5x + 3$
   (c) $\log_5(x^2 + x + 4) = 2$