

MAT 241 Section 07 Fall 2009

Problem Set 1

Assigned 9/2/09

Due 9/14/09

1. This problem was initially assigned; it is no longer due.

5. Find the domain and range of $f(x) = 2/(3x - 1)$.

7. Find the domain and range of $h(x) = \ln(x + 6)$.

8. Find the domain and range of $F(t) = 3 + \cos(2t)$.

11. Sketch the graph of the function $y = -\sin(2x)$.

14. Sketch the graph of the function $2 - \sqrt{x}$

16. Sketch the graph of the function:

$$f(x) = \begin{cases} -x & \text{if } x < 0 \\ e^x - 1 & \text{if } x \geq 0 \end{cases}$$

19. If $f(x) = \ln(x)$ and $g(x) = x^2 - 9$, find the functions: a. $f \circ g(x)$; b. $g \circ f(x)$; c. $f \circ f(x)$; and d. $g \circ g(x)$. In addition, find the domain of each function.

24. Find the inverse of the function:

$$f(x) = \frac{x + 1}{2x + 1}$$

25. Find the exact value of:

a. $e^{2\ln(3)}$

b. $\log_{10}(25) + \log_{10}(4)$

28. Graph the functions $y = x^a$, $y = a^x$, and $y = \log_a(x)$ on the same screen for two values of $a > 1$. For large values of x , which of these functions has the largest values, and which has the smallest values?

[**Hint:** You can evaluate $\log_a(x)$ using the formula:

$$\log_a(x) = \frac{\ln(x)}{\ln(a)}$$

Here, $\ln = \log_e$.]