Math 22 Section 9

Quiz 9 Solutions

1. Evaluate the following expressions:

   (a) $log_6(6^4)$

   $log_6(6^4) = 4log_6(6) = 4$

   (b) $log_3(\frac{1}{9})$

   $log_3(\frac{1}{9}) = -2log_3(3) = -2$

   (c) e^{ln5}

   $e^{ln5} = 5$

   (d) $2log_{12}3 + 2log_{12}4$

   $2log_{12}3 + 2log_{12}4 = log_{12}(3^2 4^2) = log_{12}(12^2) = 2$

2. Find the domain and vertical asymptote of

$$f(x) = log_3(x-1) - 2$$

   domain $(1, \infty)$

   vertical asymptote $x = 1$

3. Expand the expression:

(a) $log_5(\frac{x}{2})$

$log_5(\frac{x}{2}) = log_5(x) - log_5(2)$

(b) $ln(x^3e^{2x})$

$ln(x^3e^{2x}) = ln(x^3) + ln(e^{2x}) = 3ln(x) + 2x$

4. Combine the expression:

(a) $log(12) - \frac{1}{2}log(9) - log(2)$

$log(12) - \frac{1}{2}log(9) - log(2) = log(\frac{12}{(3)(2)}) = log(2)$

(b) $ln(5) + 2ln(x) + 3ln(x^2 + 5)$

$ln(5) + 2ln(x) + 3ln(x^2 + 5) = ln(5x^2(x^2 + 5)^3)$