Hon Pre-Calculus
Test Correction Quiz
Chapter 3

Name [redacted] 29

Leave Answers In Simplified Calculator Ready Form!!! Circle All Final Answers!!!

Short Answer

1. Evaluate: $\log_{27}\sqrt[5]{81}$

$\log_{27}\sqrt[5]{3^4}$

$\log_{27} 3^{4/5}$

$\frac{4}{5}\log_{27} 3$

$27^x = 3$

$27^{1/3} = 3$

$x = \frac{1}{3}$

$\frac{4}{5} \cdot \frac{1}{3} = \boxed{\frac{4}{15}}$

2. Given that $\log_b 9 = a$ and $\log_b 2 = c$, find an expression for $\log_b \frac{48}{b^3}$ in terms of a and c.

$\log_b 48 - \log_b b^3$

$\log_b 3 + \log_b 16 - 3$

$\log_b 9^{1/2} + \log_b 2^4 - 3$

$\boxed{\frac{1}{2}a + 4c - 3}$

3. Condense: $\frac{1+2\log_{27} x}{3}$

$\frac{1}{3} + \frac{2}{3}\log_{27} x$

$\frac{1}{3} + \log_{27} x^{2/3}$

$\log_{27} 3 + \log_{27} \sqrt[3]{x^2}$

$27^{1/3} = 3$

$\sqrt[3]{27} = 3$

$\boxed{\log_{27} 3\sqrt[3]{x^2}}$

4. Solve: $\log_3 x = \log_{27}(x^2 + 4x - 4)$

$\log_3 x = \log_{3^3}(x^2+4x-4)$

$x^3 = x^2 + 4x - 4$

$x^3 - x^2 - 4x + 4 = 0$

$x^2(x-1) - 4(x-1) = 0$

$(x+2)(x-2)(x-1) = 0$

$-2 \quad 2 \quad 1$

$\times \quad \checkmark \quad \checkmark$

$\boxed{x = 1, 2}$

5. Assume that the number of people infected by a newly discovered virus is growing exponentially. If the number of people infected increases from 200 to 1000 in 3 weeks, how much additional time will it take before 25000 people are infected?

$25000 = 1000(5)^{t/3}$

$25 = (5)^{t/3}$

$5^2 = 5^{t/3}$

$\frac{t}{3} = 2$

$\boxed{t = 6 \text{ weeks}}$