

NO CALCULATORS ARE ALLOWED ON THIS EXAM.

1. This problem illustrates the common mistakes that students make in calculus. In each statement below, an attempt is made to either rewrite or simplify the expression on the left side. There is a mistake in each case. Rewrite the right hand side so that the statement is correct.

A. $P(1 + rt) = P + rt$

B. $(z^2 + 3)^{1/2} = (z + 3^{1/2})$

C. $\ln a + \ln b = \ln a \cdot \ln b$

D. $\log Z - \log W = \frac{\log Z}{\log W}$

E. $\ln(4e^z) = 4z$

F. $(10^z)^2 = 10^{z^2}$

G. $(2w + 6)^3 = 2(w + 3)^3$

H. $\frac{Bx^3 + C}{x^2} = Bx + C$

I. $\frac{1}{(6y^3)} = (6y)^{-3}$

J. $\frac{1}{\sqrt[5]{(t+1)^2}} = (t+1)^{-5/2}$

K. $\ln 1 = e$

L. $\frac{1}{r^{-1} + 1} = r + 1$

FOR THE REMAINING PROBLEMS:
YOU MUST SHOW YOUR WORK TO RECEIVE FULL CREDIT.

2. Given the function $f(x) = \frac{1}{x}$, find and completely simplify $\frac{f(x+h) - f(x)}{x}$

3. Simplify completely: $\frac{z+t}{z^{-2} - t^{-2}}$

4. Simplify (you answer should have no negative exponents): $\frac{2y(y^2 + 7)^{1/2} - y^2(y^2 + 7)^{-1/2}}{y^2 + 7}$

5. Solve for y : $2x + z + xy - 3z^2y = z^2 + 2xzy$

6. Simplify: $\frac{b^{m+1}2^{m+1}}{b^m2^m}$

7. Solve for t : $\log(1-t) - \log(1+t) = 2$

8. Solve for w : $(w+1)(w+3) = 15$

9. Factor completely: $p^3(3p-2) - p(3p-2)$

10. Solve the following by completing the square: $3z^2 + 2z - 8 = 0$