MATH 12 TEST 2 REVIEW PROBLEMS

(1) SOLVE THE EQUATION $e^{2x} - 3e^{x} - 10 = 0$.

(2) SIMPLIFY THE FOLLOWING EXPRESSION, SO THAT LOGARITHMS OF PRODUCTS, QUOTIENTS, AND POWERS DO NOT APPEAR. (SHOW ALL WORK.)

$$\ln\left(\frac{\sqrt[4]{5x-8}}{\sqrt{x+3}\,(2x+1)^6}\right)$$

(3) FIND THE DOMAIN OF $y = \ln\left(\frac{x^2-16}{x^2-2x-15}\right)$.

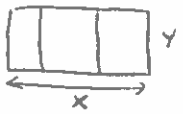
(4) EVALUATE EACH OF THE FOLLOWING:

A) $e^{2\ln 5} + \ln\frac{1}{e^4}$ B) $30\log_6\sqrt{6} + 5^{2\log_5 3}$ C) $\log_{16} 96 - \log_{16} 3$

(5) A) SOLVE THE EQUATION $\log_3(x+3) + \log_3(x-5) = 2$.

B) SOLVE THE EQUATION $5x(\ln x)^2 - 2x\ln(x^5) = 0$.

(6) A RANCHER HAS 200M OF FENCING TO BUILD 3 ADJACENT RECTANGULAR CORRALS. FIND THE VALUES OF X AND Y SO THAT THE TOTAL ENCLOSED AREA IS A MAXIMUM.



(7) FIND THE EQUATION FOR THE SLANTED ASYMPTOTE TO THE GRAPH OF $y = \frac{x^2-5x-14}{x-8}$. (SHOW THE COMPLETE DIVISION.)

(8) IF $f(x) = e^{5x} - 4$, FIND A FORMULA FOR $f^{-1}(y)$.

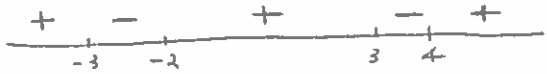
(9) FOR THE FUNCTION $y = \frac{(x-4)(x+3)}{(x-3)(x+2)}$,

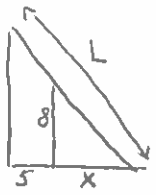
A) FIND EQUATIONS FOR THE ASYMPTOTES TO THE GRAPH.

VERTICAL: _____ HORIZONTAL: _____

B) FIND THE X-COORDINATES OF THE POINTS OF INTERSECTION WITH THE HORIZONTAL ASYMPTOTE, IF ANY.

C) USE THE SIGN CHART BELOW, THE INTERCEPTS, AND THE INFORMATION FOUND IN PARTS A) AND B) TO SKETCH THE GRAPH.



(10) 

A FENCE 8 FT TALL IS 5 FT AWAY FROM A BUILDING. IF A LADDER REACHES FROM THE GROUND OVER THE FENCE TO THE BUILDING, WRITE THE LENGTH L OF THE LADDER AS A FUNCTION OF X, THE DISTANCE FROM THE BASE OF THE LADDER TO THE FENCE.

(11) FIND THE POINT ON THE RIGHT HALF OF THE PARABOLA $y = x^2$ WHICH IS CLOSEST TO THE POINT $(0, \frac{11}{2})$.

(12) SOLVE THE EQUATION $e^{x} - 2e^{-x} = 4$.