MATH 251 (PHILLIPS) MIDTERM 0 EXTRA PROBLEM LIST SET 4

1. Find all real solutions to the equation $\ln(3 - 2x) - 2 = 0$. If no real solution exists, write "no solution".

2. Write as a single fraction, and simplify as much as possible: $\dfrac{1}{x+3} - \dfrac{1}{x-4}$

3. Find all real solutions to the equation $\dfrac{e^x + x^3}{x^3} = 1$. If no real solution exists, write "no solution".

4. Find all real numbers a such that $\frac{1}{|a|} = -\frac{1}{a}$.

5. Find all real solutions to the equation $x(x - 1) = 20$. If no real solution exists, write "no solution".

6. Let $f(x) = 2 - x$. Evaluate the expression $f(x + 3) - f(2x + 1)$, and simplify it as much as possible.

7. Multiply out: $(x - 2)(x^2 - 5x - 2)$.

8. Simplify the following expression as much as possible. If no simplification is possible, write "not possible": $\dfrac{2t^2 + 2}{2t^2 + 6}$

9. Simplify completely (for $x \neq 0$): $\dfrac{(2x^5)^2}{(2x^{-2})^3}$

10. The curve in the graph below (at the left) is the graph of the circle $x^2 + x^2 = 9$. Find the **exact** values of **both** coordinates of **all** points at which this curve intersects the vertical line.