

Name : _____ ID. # : _____ SER. # : _____

1. Simplify the following expressions:

$$(a) \frac{x^2 - 64}{x^2 + 9} \div \frac{x^2 + 5x - 24}{x^3 - 3x^2 + 9x - 27} \quad (3.5 \text{ pts})$$

$$(b) \frac{3x^{-4} - 3y^{-4}}{2x^{-1} - 2y^{-1}} \quad (3.5 \text{ pts})$$

2. (a) Determine whether the following equation is an identity, a conditional equation, or a contradiction: $\frac{4x-9}{2} = 2x + \frac{9}{2}$ (explain) (2 pts)

(b) Solve the equation: $|x| + |x - 1| = 2$

(4 pts)

3. (a) Find the real and imaginary parts of the complex number:
 $\frac{2-i}{1+2i} - (1-3i)(1+3i)$

(3 pts)

(b) Solve the quadratic equation by completing to a perfect square:
 $2x^2 + 10x + 14 = 0$

(3 pts)