

MATH 140A: MIDTERM I

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1. Evaluate the followings. Write your final answer without (negative) exponents.

(1) $1 - |1 - |-1||$

(2) $\left(\frac{81}{16}\right)^{-3/4}$

2. Simplify the given expression. Write your final answer without fractional expression.

$$\frac{\frac{y}{x} - \frac{x}{y}}{\frac{1}{y} - \frac{1}{x}}$$

3. Factor the expression completely: $(2x + 1)(3x - 2) - 5(2x - 1)$

4. Find the real solutions: $\sqrt{x + \sqrt{x + 5}} = 1$

5. Solve the equation by completing the square: $2x^2 + 4x + 1 = 0$

6. Find the real solutions:

$$\frac{2x}{x + 1} = \frac{2x - 1}{x}$$

7. Solve the equation by factoring: $x^3 - 3x^2 - 4x + 12 = 0$