

**PRE-TEST \_\_\_\_\_ MTH4110 Operations on Algebraic Fractions**

**Question 1**

Reduce the following algebraic fraction to lowest terms. Show all steps in the solution.

$$\frac{x^2 + 2x - 15}{25 - x^2}$$

**Question 2**

Divide the following algebraic fractions and reduce the result to lowest terms. Show all the steps in the solution.

$$\frac{4x - 2x^2}{x^2 - 5x + 6} \div \frac{16x^3 - 4x^2}{2x^2 - x + 3}$$

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**Question 3**

Perform the following operations and reduce the result to lowest terms. Show all the steps in the solution.

$$\frac{3}{4-4b+b^2} + \frac{4}{4-b^2} - \frac{2}{b-2}$$

**Question 4**

Determine the product of the following algebraic fractions and reduce the result to lowest terms. Show all steps in the solution.

$$\frac{36-x^4}{4x-24} \bullet \frac{3x^3-18x^2+2x-12}{x^4-4x^2-12} \bullet \frac{4x^2+8}{30+5x^2}$$

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**Question 5**

Perform the following operations and reduce the result to lowest terms. Show all the steps in the solution.

$$\frac{x^2 - 4}{x^2 + xy} \bullet \frac{3x^3 - 3xy^2}{4x - 8} \div \frac{x^2 + 2x - xy - 2y}{16 - 4x}$$

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**Question 6**

Reduce the following algebraic expression to lowest terms, making sure to observe the order of operations. Show all steps in the solution.

$$\left(1 + \frac{x+y}{x-y}\right) \div \frac{2x^2 + 6x}{x^2 - 2xy + y^2}$$

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**Question 7**

Reduce the following algebraic expressions to lowest terms, making sure to observe the order of operations. Show all steps in the solution.

$$\left( \frac{e^2 - 25}{e - 5} + 2 - \frac{2e - 4d}{e} \right) \div \frac{2e^2 + 8de}{e^2 - 3e - 10}$$

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**Question 8**

Reduce the following algebraic expressions to lowest terms, making sure to observe the order of operations. Show all steps in the solution.

$$\frac{r^2}{s^2 - r^2} - \frac{s^2}{r + s} \bullet \frac{s^2 + r^2}{2rs^2 - 2s^3}$$