Unit 6 Test – Rational Expressions and Equations

Name:_____

_____/25 =_____%

Part A: Multiple Choice   Place the letter that corresponds with the best answer in the space provided to the right. (8 marks)

1. What are the non – permissible values for $\dfrac{x}{2(x+3)} + \dfrac{3x}{(x+3)(x+1)}$?

    1._____

    A) $x \neq 0, -3$
    C) $x \neq 0, -3, -1$

    B) $x \neq -3, -1$
    D) $x \neq 0, -1$

2. Factor the following expression: $2x^2 - 7x + 3$

    2._____

    A) $(x - 6)(x - 1)$
    C) $(2x - 3)(x - 1)$

    B) $(2x + 1)(x - 3)$
    D) $(2x - 1)(x - 3)$

3. Simplify the following: $\dfrac{x^2+3x-4}{2x^2+12x+16}$

    3._____

    A) $\dfrac{(x-1)}{2(x+2)}$

    B) $\dfrac{2(x-1)}{(x+2)}$

    C) $\dfrac{(x-1)}{(x+2)}$

    D) $\dfrac{(x+1)}{2(x-2)}$

4. Simplify the following: $\dfrac{x^2}{6} \div \dfrac{3x}{2y}$

    4._____

    A) $\dfrac{xy}{9}$

    B) $\dfrac{x^3}{4y}$

    C) $\dfrac{x^3}{2y}$

    D) $\dfrac{9}{xy}$

5. Simplify: $\dfrac{4-2x}{x-2}$

    5._____

    A) $x - 2$

    B) 2

    C) -2

    D) $2x$

6. Simplify the following: $\dfrac{5}{x+3} - \dfrac{(x-1)}{x+3}$

    6._____

    A) $\dfrac{(4-x)}{(x+3)}$

    B) $\dfrac{6-x}{(x+3)(x+3)}$

    C) $\dfrac{6}{(x+3)}$

    D) $\dfrac{(6-x)}{(x+3)}$

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7. The area of a rectangle is $3x^2 + 7x - 6$ and the width of the rectangle is $x + 3$. What is the simplified expression for the length?

7._____

A) $\frac{1}{3x+2}$

B) $3x - 2$

C) $3x + 2$

D) $\frac{1}{3x-2}$

8. Simplify the following: $\frac{1}{x} = \frac{x}{x+6}$

8._____

A) $x = -2, 3$

B) $x = 2, -3$

C) $x = 2$

D) $x = -3$

Part B: **Short Answer Questions**   **Complete each of the following in the space provided.**

Be sure to show ALL necessary workings. (17 marks)

1. Simplify. $\frac{x}{x^2-3x-4} - \frac{4}{x+1}$ (4 marks)

2. Simplify. State all non – permissible values.   (4 marks)

$$\frac{x^2 + 2x - 15}{2x^2 - 5x - 3} \div \frac{3x^2 + 21x + 30}{2x^2 + 3x + 1}$$

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3. Simplify.

$$\dfrac{\dfrac{-2}{x-7}+\dfrac{4}{x+7}}{\dfrac{x}{x^2-49}-\dfrac{2}{x-7}}$$

(4 marks)

4. Josh solved the following equation incorrectly. Identify and explain his mistake and find the correct solution. (5 marks)

$$1 + \frac{2x}{x+4} = \frac{3}{x-1}$$

$$1 + 2x(x-1) = 3(x+4)$$

$$1 + 2x^2 - 2x = 3x + 12$$

$$2x^2 - 5x - 11 = 0$$

$$x = \frac{5 \pm \sqrt{113}}{4}$$