$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Part 1. Selected Response. Place the letter of the correct response in the space on the right. (/10)

1.   Determine the non permissible values for $\dfrac{x-4}{x(3x+1)}$ 1.____

   A)   4   B) $-\frac{1}{3}, 1, 4$ C) $0, -\frac{1}{3}$ D) $4, -1, 0$

2.   Choose an equivalent expression for $\dfrac{6x-3}{3x+3}, \ x \neq -1$ 2.____

   A) $\dfrac{x(6x-3)}{x(3x+3)}$ B) $\dfrac{12x-3}{6x+3}$

   C) $\dfrac{6x^2-3}{3x^2+3}$ D) $\dfrac{2x-1}{x+1}$

3.   Simplify: $\dfrac{10x+2}{25x^2-1}$ 3.____

   A) $\dfrac{5}{15x+1}$ B) $\dfrac{2}{5x-1}$ C) $\dfrac{2x}{5x+1}$ D) $\dfrac{5x}{2x-1}$

4.   Simplify: $\dfrac{3x^2}{3x^2-6x}$ 4.____

   A) $\dfrac{x}{x-2}$ B) $-\dfrac{1}{2}$ C) $\dfrac{2}{x-2}$ D) $\dfrac{1}{2x}$

5.   Simplify: $\dfrac{2x(x+4)}{3x} \cdot \dfrac{6(x-1)}{4(x+4)(x-1)}$ 5.____

   A) $\dfrac{2}{3x}$ B) $\dfrac{2}{3}$ C) $4x$ D)   1

6.   Simplify: $\dfrac{9x}{6} \div \dfrac{2x^3}{3}$ 6.____

   A) $\dfrac{4x^2}{9}$ B) $\dfrac{9}{4x^2}$ C) $\dfrac{9x^4}{2}$ D) $\dfrac{2}{9x^4}$

7. Choose the expression with the variable restriction $x \neq -4, -2, 1$ 7.____

    A) $\dfrac{x+2}{x+4} \cdot \dfrac{x-1}{x}$
               B) $\dfrac{x}{x+4} \cdot \dfrac{x-1}{x+2}$

    C) $\dfrac{x+2}{x} \div \dfrac{x+4}{x-1}$
               D) $\dfrac{x}{x-1} \div \dfrac{x+2}{x+4}$

8. Simplify: $\dfrac{3x-4}{2x} + \dfrac{4x-2}{2x}$ 8.____

    A) $\dfrac{7x-6}{4x}$
               B) $\dfrac{7x^2-6}{2x}$

    B) $\dfrac{7x-6}{2x}$
               D) $\dfrac{7x^2-6}{4x}$

9. Identify the step where the ERROR occurred.   9.____

    Simplify: $\dfrac{4}{x+2} + \dfrac{5}{x-1}$

$$\dfrac{4}{x+2} \cdot \dfrac{(x-1)}{(x-1)} + \dfrac{5}{x-1} \cdot \dfrac{(x+2)}{(x+2)}$$

Step 1 $\dfrac{4x-4}{(x+2)(x-1)} + \dfrac{5x+10}{(x-1)(x+2)}$

Step 2 $\dfrac{9x+6}{(x+2)(x-1)}$

Step 3 $\dfrac{3(3x+2)}{(x+2)(x-1)}$

Step 4 $\dfrac{3(3)}{(x-1)}$

    A) Step 1   B) Step 2   C) Step 3   D) Step 4

10. Solve for x: $\dfrac{12}{x} + \dfrac{6}{2x} = \dfrac{5}{x-2}$ 10.____

    A) 3   B) 4   C) 5   D) 6

Part 2. Constructed Response. Show all workings to receive full credit for each question.

11. Simplify and state the restriction(s): (/6)

A) $\dfrac{4x - 2x^2}{x^2 + 4x}$

B) $\dfrac{9x^2 - 16}{6x^3 + 8x^2}$

12. Simplify and state the non-permissible values. (/10)

A) $\dfrac{3x + 6}{3x - 3} \cdot \dfrac{8 - 4x}{4 - x^2}$

B) $\dfrac{9x^2 - 4}{4x + 8} \div \dfrac{15x - 10}{x^2 + 2x}$

13. Simplify and state the non-permissible values. (/5)

A) $\dfrac{4x^2+1}{x-3} - \dfrac{3x^2+9}{x-3}$

B) $\dfrac{4}{x-1} + \dfrac{-3-3x}{x^2-1}$

14. Solve for x and state the non-permissible values: $\dfrac{6}{x+4} - 1 = \dfrac{-1}{x}$ (/4)

15. Mandy and Sandy are twins. They share a room. Once a week they have to clean their room. If they work together, they can clean their room in 2 minutes. If Mandy cleans the room by herself, it will take 3 less minutes than when Sandy cleans the room by herself. Set up a rational equation to model this situation. Use the equation to algebraically determine how long it will take Mandy to clean their room by herself.

(/5)