Student: _____ **Instructor:** Andreas Lazari
Date: _____ **Course:** Math1111-Summer2018 **Assignment:** Section P.6 Homework

1. Find all numbers that must be excluded from the domain of the rational expression.

$$\frac{x-1}{x^2+8x+7}$$

$x^2+8x+7=(x+1)(x+7)$ $\quad x+1=0 \Rightarrow x=-1$ $\quad x+7=0 \Rightarrow x=-7$.

Type the values for which the rational expression is undefined. Select the correct choice below and fill in any answer boxes within your choice.

○ **A.** $-1,-7$ (Use a comma to separate answers as needed.)

○ **B.** The rational expression is defined for all real numbers.

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2. Simplify the rational expression. Find all numbers that must be excluded from the domain of the simplified rational expression in order for it to be equivalent to the original expression.

$$\frac{3x-12}{x^2-8x+16} = \frac{3(x-4)}{(x-4)(x-4)} = \frac{3}{x-4}$$

Simplify the rational expression.

$$\frac{3x-12}{x^2-8x+16} = \frac{3}{x-4}$$ (Simplify your answer. Use positive exponents only.)

Find the numbers that must be excluded from the domain of the simplified rational expression in order for it to be equivalent to the original expression. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

○ **A.** $x \neq$ 4 (Use a comma to separate answers as needed.)

○ **B.** There are no numbers excluded from the domain.

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3. Simplify the rational expression. Find all numbers that must be excluded from the domain of the simplified rational expression in order for it to be equivalent to the original expression.

$$\frac{x^2-4x+4}{4x-8} = \frac{(x-2)(x-2)}{4(x-2)}$$

Simplify the rational expression. Select the correct choice below and fill in any answer boxes in your choice.

$$\frac{x^2-4x+4}{4x-8} = \frac{x-2}{4}$$

(Simplify your answer. Use positive exponents only. Use integers or fractions for any numbers in the expression.)

Find the numbers that must be excluded from the domain of the simplified rational expression in order for it to be equivalent to the original expression. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

○ **A.** $x \neq$ 2 (Use a comma to separate answers as needed.)

○ **B.** There are no numbers excluded from the domain.

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4. Simplify the rational expression. Find all numbers that must be excluded from the domain of the simplified rational expression in order for it to be equivalent to the original expression.

$$\frac{x^2+6x+9}{x^2-9} = \frac{(x+3)(x+3)}{(x+3)(x-3)}$$

Select the correct choice below and fill in any answer boxes within your choice.

○ **A.** $\frac{x^2+6x+9}{x^2-9} = \frac{x+3}{x-3}$, $x \neq -3, 3$

(Use a comma to separate answers as needed.)

○ **B.** No numbers must be excluded.

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5. Multiply the expressions.

$$\frac{x^2-11x+30}{x^2-2x-24} \cdot \frac{x^2-16}{x^2-25} = \frac{(x-5)(x-6)}{(x-6)(x+4)} \cdot \frac{(x-4)(x+4)}{(x-5)(x+5)}$$

Select the correct choice below and fill in the answer box(es) within your choice.

○ **A.** $\frac{x^2-11x+30}{x^2-2x-24} \cdot \frac{x^2-16}{x^2-25} = \frac{x-4}{x+5}$, $x \neq -4, 6, -5, 5$

(Simplify your answer. Use a comma to separate answers as needed.)

○ **B.** $\frac{x^2-11x+30}{x^2-2x-24} \cdot \frac{x^2-16}{x^2-25} =$ _____ and no numbers must be excluded.

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6. Divide as indicated.

$$\frac{10x^2+25}{x-3} \div \frac{6x^2+15}{x^2-9} = \frac{(10x^2+25)}{x-3} \cdot \frac{x^2-9}{6x^2+15} = \frac{5(2x^2+5)}{x-3} \cdot \frac{(x-3)(x+3)}{3(2x^2+5)}$$

Select the correct choice below and fill in the answer box(es) to complete your choice.
(Simplify your answer. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

○ **A.** $\frac{10x^2+25}{x-3} \div \frac{6x^2+15}{x^2-9} = \frac{5(x+3)}{3}$, $x \neq -3, 3$

○ **B.** $\frac{10x^2+25}{x-3} \div \frac{6x^2+15}{x^2-9} =$ _____, no numbers must be excluded.

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7. Divide as indicated.

$\frac{x^2-64}{4x-4} \div \frac{x^2+16x+64}{x^2+7x-8} =$ $\frac{(x-8)(x+8)}{4(x-1)} \cdot \frac{(x-1)(x+8)}{(x+8)(x+8)}$

$4(x-1)$ $(x-1)(x+8)$

Select the correct choice below and fill in the answer box(es) to complete your choice.
(Simplify your answer. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

○ A. $\frac{x^2-64}{4x-4} \div \frac{x^2+16x+64}{x^2+7x-8} =$ $\frac{x-8}{4}$, $x \neq 1, -8$

○ B. $\frac{x^2-64}{4x-4} \div \frac{x^2+16x+64}{x^2+7x-8} =$ _____, no numbers must be excluded.

8. Add.

$\frac{7}{x-6} + \frac{2}{x+7} = \frac{7(x+7)+2(x-6)}{(x-6)(x+7)} = \frac{7x+49+2x-12}{(x-6)(x+7)} = \frac{9x+37}{(x-6)(x+7)}$

Select the correct choice below and fill in any answer boxes within your choice.
(Simplify your answer. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

○ A. $\frac{7}{x-6} + \frac{2}{x+7} =$ $\frac{9x+37}{(x-6)(x+7)}$, $x \neq 6, -7$

○ B. $\frac{7}{x-6} + \frac{2}{x+7} =$ _____, no numbers must be excluded.

9. Add as indicated.

$\frac{2x}{x+9} + \frac{x+9}{x-9} = \frac{2x(x-9)+(x+9)(x+9)}{(x+9)(x-9)} = \frac{2x^2-18x+x^2+18x+81}{(x+9)(x-9)} = \frac{3x^2+81}{(x+9)(x-9)}$

Select the correct choice below and fill in the answer box(es) to complete your choice.
(Simplify your answer. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

○ A. $\frac{2x}{x+9} + \frac{x+9}{x-9} =$ $\frac{3x^2+81}{(x+9)(x-9)}$, $x \neq -9, 9$

○ B. $\frac{2x}{x+9} + \frac{x+9}{x-9} =$ _____, no numbers must be excluded.

10. Add as indicated.

$\frac{2}{3x+6} + \frac{5}{4x+8} = \frac{2(4x+8)+5(3x+6)}{(3x+6)(4x+8)} = \frac{8x+16+15x+30}{(3x+6)(4x+8)} = \frac{23x+46}{(3x+6)(4x+8)}$

$= \frac{23(x+2)}{3(x+2)4(x+2)} = \frac{23}{12(x+2)}$

Select the correct choice below and fill in the answer box(es) to complete your choice.
(Simplify your answer. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

○ A. $\frac{2}{3x+6} + \frac{5}{4x+8} =$ $\frac{23}{12(x+2)}$, $x \neq -2$

○ B. $\frac{2}{3x+6} + \frac{5}{4x+8} =$ _____, no numbers must be excluded.

1. A. $-1, -7$ (Use a comma to separate answers as needed.)

2. $\frac{3}{x-4}$

A. $x \neq$ 4 (Use a comma to separate answers as needed.)

3. $\frac{x-2}{4}$

A. $x \neq$ 2 (Use a comma to separate answers as needed.)

4. A. $\frac{x^2+6x+9}{x^2-9} = \frac{x+3}{x-3}$, $x \neq -3, 3$ (Use a comma to separate answers as needed.)

5. A. $\frac{x^2-11x+30}{x^2-2x-24} \cdot \frac{x^2-16}{x^2-25} = \frac{x-4}{x+5}$, $x \neq -4, 6, 5, -5$
(Simplify your answer. Use a comma to separate answers as needed.)

6. A. $\frac{10x^2+25}{x-3} + \frac{6x^2+15}{x^2-9} = \frac{5(x+3)}{3}$, $x \neq 3, -3$

7. A. $\frac{x^2-64}{4x-4} + \frac{x^2+16x+64}{x^2+7x-8} = \frac{x-8}{4}$, $x \neq 1, -8$

8. A. $\frac{7}{x-6} + \frac{2}{x+7} = \frac{9x+37}{(x-6)(x+7)}$, $x \neq -7, 6$

9. A. $\frac{2x}{x+9} + \frac{x+9}{x-9} = \frac{3x^2+81}{(x+9)(x-9)}$, $x \neq 9, -9$

10. A. $\frac{2}{3x+6} + \frac{5}{4x+8} = \frac{23}{12(x+2)}$, $x \neq -2$