Secondary III 6-2 HW

Name: Selected Answers

Adding and Subtracting Rational Functions

Given a rational expression, identify the excluded values by finding the zeroes of the denominator.

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

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

$\boxed{x \neq -4, 1}$

2. $\dfrac{4}{x(x+17)}$

Simplify the given expression:

3. $\dfrac{x+8}{x^2+9x+8} = \dfrac{\cancel{(x+8)}}{(x+1)\cancel{(x+8)}} = \boxed{\dfrac{1}{(x+1)}}$

4. $\dfrac{6x^2+5x+1}{3x^2+4x+1} = \cancel{(6x+1)(x+1)}$

$\dfrac{\cancel{(3x+1)}(2x+1)}{\cancel{(3x+1)}(x+1)} = \boxed{\dfrac{2x+1}{x+1}}$

5. $\dfrac{x^2-1}{x+1}$

Find the LCD for each set of rational expressions

11. $\dfrac{4x+12}{x^2+5x+6}$ and $\dfrac{5x+15}{10x+20}$

12. $\dfrac{-11}{x^2-3x-28}$ and $\dfrac{2}{x^2-2x-24}$

$(x-7)(x+4)$ $(x-6)(x+4)$

$\boxed{\text{LCD: } (x-7)(x+4)(x-6)}$

Add or subtract the given expressions, simplifying each result and noting the combined excluded values

6. $\dfrac{1}{x+1} + \dfrac{(-x+1)}{x} \cdot \dfrac{(x+1)}{(x+1)} = \dfrac{x}{x(x+1)} + \dfrac{-x^2+1}{x(x+1)}$

LCD: $(x+1)(x)$

$= \boxed{\dfrac{-x^2+x+1}{x(x+1)}}$ ← Not factorable

$\boxed{x \neq -1, 0}$

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

20. $\dfrac{1}{x^2+3x-4} - \dfrac{1}{x^2-3x+2}$

21. $\dfrac{3}{x^2-4} - \dfrac{(x+5)}{x+2}$ $(x-2)$ $(x-2)$ $x \neq -2, 2$

$(x+2)(x-2)$

LCD: $(x+2)(x-2)$

$\boxed{\dfrac{-x^2-3x+13}{(x+2)(x-2)}}$

$\dfrac{3}{(x+2)(x-2)} - \dfrac{(x^2+3x-10)}{(x+2)(x-2)} = \dfrac{3-x^2-3x+10}{(x+2)(x-2)}$

$-x^2-3x+13$

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8. $\dfrac{x-1}{x^2-5x+6}+\dfrac{x}{x-3}$ LCD: $(x-3)(x-2)$ $x \neq 3, 2$

$(x-3)(x-2)$

$\dfrac{x-1}{(x-3)(x-2)} + \dfrac{x^2-2x}{(x-3)(x-2)} = \boxed{\dfrac{x^2-x-1}{(x-3)(x-2)}}$

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

29. Match each expression with the correct excluded value(s).

a. $\dfrac{3x+5}{x+2}$ _____ no excluded values

b. $\dfrac{1+x}{x^2-1}$ _____ $x \neq 0, -2$

c. $\dfrac{3x^4-12}{x^2+4}$ _____ $x \neq 1, -1$

d. $\dfrac{3x+6}{x^2(x+2)}$ _____ $x \neq -2$

31. Communicate Mathematical Ideas Write a rational expression with excluded values at $x = 0$ and $x = 17$.

$x \neq 0, 17$

$\dfrac{\text{Anything}}{x(x-17)}$

Review

State the domain and range of each function

1. $f(x)=-2\sqrt{x-3}$

2. $f(x)=\sqrt{3x+9}-5$

Graph the following function

3. $g(x)=2\sqrt[3]{x-2}$