4-1 Homework

Find any points of discontinuity for each rational function.

1. $y=\frac{x+5}{x^{2}+9x+20}$ 2. $ y=\frac{(x-2)(x+1)}{3x^{2}-7x+2}$

Domain: \_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_ Domain: \_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_

Find the vertical asymptotes of the graph of each rational function.

3. $y= \frac{x-3}{(x+3)(x+2)}$ 4. $ y= \frac{x^{2}+2x+3}{x^{2}+2x-3}$

Domain: \_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_ Domain: \_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_

Find the vertical asymptotes and holes for the graph of each rational function, then find the domain and range.

5. $y=\frac{3}{x-2}$ 6. $y= \frac{x+5}{x+5}$ 7. $y=\frac{(x+3)(x-2)}{(x-2)(x+1)}$ 8. $y= \frac{x^{2}-4}{x+2}$

VA: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ VA: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ VA: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ VA: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Holes: \_\_\_\_\_\_\_\_\_\_\_ Holes: \_\_\_\_\_\_\_\_\_\_\_ Holes: \_\_\_\_\_\_\_\_\_\_\_ Holes: \_\_\_\_\_\_\_\_\_\_\_

Domain: \_\_\_\_\_\_\_\_\_\_ Domain: \_\_\_\_\_\_\_\_\_ Domain: \_\_\_\_\_\_\_\_\_\_\_ Domain: \_\_\_\_\_\_\_\_\_\_

Range: \_\_\_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_\_

4-2 Homework

Find any vertical or horizontal asymptotes of the graph of each rational function.

1. $y=\frac{5}{x+6}$ 2. $y=\frac{x+2}{2x^{2}-8}$ 3. $y=\frac{x^{2}+2}{x^{2}-1}$

VA and HA: \_\_\_\_\_\_\_\_\_\_\_\_ VA and HA: \_\_\_\_\_\_\_\_\_\_\_\_ VA and HA: \_\_\_\_\_\_\_\_\_\_\_\_

Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Range: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Sketch a graph of: $\frac{3x}{x-4}$ 5. Sketch a graph of: $\frac{x+3}{(x-1)(x-6)}$



 Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Range: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Your class is going on a field trip to a local theater. It costs $60 to rent the bus. Each theater ticket costs $5.50.
	1. Write a function c(x) to represent the cost per student if x students sign up.
	2. How many students must sign up if the cost is to be no more than $10 per student?
	3. What number of students would make an undefined solution?
	4. How many students would need to go for the trip to cost nothing per person? How would this look on your graph?

9. A student listed the asymptotes of the function $y=\frac{x^{2}-3x+2}{x^{2}+6x+5}$ as shown below. Explain the student’s error. What are the correct asymptotes?

Vertical asymptotes: x = 1, x = 2

Horizontal asymptotes: y=-1, y=-5

4-3 Homework

Simplify each rational expression. State any restrictions on the variables.

1. $ \frac{3x-3}{x^{2}-x}$ 2. $-\frac{5x^{3}y}{15xy^{3}}$ 3. $\frac{6c^{2}+9c}{3c}$ 4. $\frac{x^{2}+8x+16}{x^{2}-2x-24}$

Multiply. State any restrictions on the variables.

5. $\frac{4x^{2}}{5y}∙\frac{7y}{12x^{4}}$ 6. $\frac{8y-4}{10y-5}∙\frac{5y-15}{3y-9}$

7. $\frac{x^{2}-4}{x^{2}-1}∙\frac{1-x}{x^{2}+2x}$ 8. $\frac{x^{2}-4}{\left(x-2\right)\left(x+6\right)}∙\frac{x^{2}-36}{\left(x+2\right)\left(x-3\right)}$

Homework 4-4

Divide. State any restrictions on the variables.

1. $\frac{3x^{3}}{5y^{2}}÷\frac{6y^{-3}}{5x^{-5}}$ 2. $\frac{3y-12}{2y+4}÷\frac{6y-24}{8+4y}$ 3. $\frac{\frac{(y-3)(y-2)}{y^{3}}}{\frac{y^{2}+3y-10}{4y^{2}}}$

4. $\frac{y^{2}-5x+6}{2y+4}÷\frac{2y-6}{(y-2)(y+5)}$ 5. $\frac{(2y-5)(y+3)}{y^{2}+7x-18}÷\frac{y^{2}+6y+9}{(y+9)(y-3)}$

Homework 4-5

Find the least common multiple on each pair of polynomials.

1. 9(x+2)(2x-1) and 3(x+2) 2. $x^{2}-1 and x^{2}+2x+1$

Simplify each sum or difference. State any restrictions on the variables.

$3. \frac{a+11}{3a-5}+\frac{a-21}{3a-5}$ 4. $\frac{1}{x^{2}-4}+\frac{6}{x+2}$

5. $\frac{m}{3m+6}-\frac{4m}{m+2} $ 6. $\frac{b-4}{b^{2}+2b-8}-\frac{b+2}{b^{2}-16}$

7. $\frac{5x}{x^{2}-x-6}+\frac{4}{(x+2)(x+2)}$ 8. $\frac{1}{2x}+\frac{1}{2x}$

4-6 Homework

Simplify each complex fraction

1. $\frac{\frac{1}{x}}{\frac{2}{y}}$ 2. $\frac{1-\frac{1}{4}}{2-\frac{3}{5}}$ 3. $\frac{\left(\frac{2}{x+y}\right)}{\frac{5}{x+y}}$ 4. $\frac{\frac{3}{x-4}}{1-\left(\frac{2}{x-4}\right)}$

5. a. $\frac{\frac{1}{2}-\frac{x+5}{4}}{\frac{x^{2}}{2}-\frac{5}{2}}$ b. $\frac{\frac{x-6}{6}-\frac{x-2}{x-6}}{\frac{36}{x-2}+\frac{4}{9}}$

6. Simplify the complex fraction: $\frac{\frac{1}{xy}-\frac{1}{y^{2}}}{\frac{1}{x^{2}y}-\frac{1}{xy^{2}}}$

4-7 Homework

Solve each equation. Check each solution.

1. $\frac{5a+1}{6}=\frac{a-1}{3}$ 2. $\frac{2}{n}+\frac{n+2}{n+1}=-\frac{2}{n^{2}+n}$

$3. \frac{1-3x}{4x}=\frac{7}{x}$ 4. $\frac{5}{2x}-\frac{2}{3}=\frac{1}{x}+\frac{5}{6}$

5. $ \frac{3}{2x}-\frac{5}{3x}=2$ 6. $\frac{5x}{4}-\frac{3}{x}=\frac{1}{4}$