7.4 Explorations

1. a. $\dfrac{4}{x-1}$; C; When $x = 1$, the denominator of each expression is zero.

b. $\dfrac{2x-1}{x(x-1)}$; F; When $x = 1$, the denominator of the first expression is zero, and when $x = 0$, the denominator of the second expression is zero.

c. 0; G; When $x = 2$, the denominator of each expression is zero.

d. $\dfrac{2}{(x-1)(x+1)}$; B; When $x = 1$, the denominator of the first expression is zero, and when $x = -1$, the denominator of the second expression is zero.

e. $\dfrac{-1}{x+2}$; A; When $x = -2$, the denominator of each expression is zero.

f. $\dfrac{x+2}{x(x-2)}$; H; When $x = 0$, the denominator of the first expression is zero, and when $x = 2$, the denominator of the second expression is zero.

g. $\dfrac{-3x}{(x+2)(x-1)}$; E; When $x = -2$, the denominator of the first expression is zero, and when $x = 1$, the denominator of the second expression is zero.

h. $\dfrac{1}{x}$; D; When $x = 0$, the denominator of each expression is zero.

2. a. *Sample answer:* $\dfrac{x}{x+1} - \dfrac{x+2}{x+1}$; The denominator of each expression must have the factor $x + 1$ because the domain is all real numbers except -1.

b. *Sample answer:* $\dfrac{x+3}{x+1} + \dfrac{x}{x-3}$; The denominators must have the factors $x + 1$ and $x - 3$ because the domain is all real numbers except -1 and 3.

c. *Sample answer:* $\dfrac{x-2}{x(x+1)} + \dfrac{x}{x-3}$; The denominators must have the factors $x + 1$, x, and $x - 3$ because the domain is all real numbers except -1, 0, and 3.

3. The domain is all real numbers except any value of x that makes the denominator of any term equal to zero.

4. The terms must be rewritten using a common denominator before adding the numerators; $\dfrac{x^2 - x + 12}{(x+4)(x-4)} = \dfrac{x+3}{x+4}$, $x \neq 4$

7.4 Extra Practice

1. $-\dfrac{4}{x-1}$

2. $\dfrac{5x}{3x-5}$

3. $6, x \neq -4$

4. $2x, x \neq 7$

5. $9x^3(x-7)$

6. $(2x+1)(x+5)$

7. $(x+2)(x+3)(x-6)$

8. $\dfrac{37}{10x}$

9. $\dfrac{18x+114}{(x-2)(x+8)}$

10. $\dfrac{3x^2 - 9x + 10}{(2x+1)(x-3)}$

11. $\dfrac{x-2}{x+1}, x \neq 7$

12. $\dfrac{x(x-30)}{10(5x+1)}, x \neq 0$

13. $\dfrac{4}{x-1}, x \neq 11, x \neq -4$