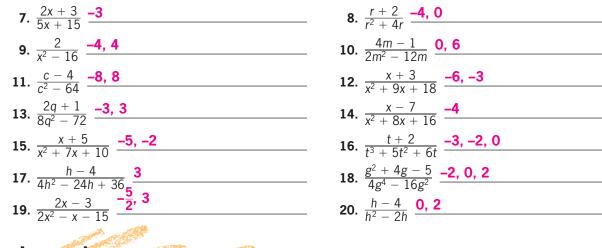
NAME		
	Simplifying Rational Expressions Finding Restricted Values of Rational Expressions	independen practice
	ricted values of the following rational	-
1. $\frac{2+x}{5}$ <u>no restricted values</u>		2. $\frac{3}{x}$ 0
3. $\frac{6x}{x+1} = \frac{-1}{2}$		4. $\frac{c+1}{c-5}$ 5
3. $\frac{6x}{x+1} = \frac{-1}{\frac{-3}{4}}$ 5. $\frac{4y-3}{4y+3} = \frac{-3}{4}$		6. $\frac{4z-6}{7}$ no restricted values
7. $\frac{2x+3}{5x+15}$ -3		8. $\frac{r+2}{r^2+4r}$ -4, 0



Journal COLUMN STREET

- 1. Martha does not understand why the denominator of a rational expression cannot have a value of zero. Explain to her why the expression $\frac{2}{0}$ is undefined.
- **2.** Explain why –3 is excluded from the domain of the expression $\frac{2x}{x+3}$. **3.** Explain how one would find the restricted values of $\frac{3x+1}{x^2-8x+12}$.
- 4. Jolie says that -2 and 4 are the restricted values for a certain rational expression. Find an expression that has these restricted values.
- **5.** Find the value of the expression $\frac{6x}{x-2}$ when x is equal to zero. Is zero a restricted value? Explain.

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Module 15 Lesson 1

DIGITAL

Cumulative Review

Factor completely.

1. $5x + 10y + 25z \frac{5(x + 2y + 5z)}{5(x + 2y + 5z)}$	2. $4m^2z + 12mz^2 - 18m^2$ 2m(2mz + 6z² - 9m)
3. $r^2 - 5r - 36 (r - 9)(r + 4)$	4. $t^2 - 100 \ (t - 10)(t + 10)$
5. $4u^2 - 25$ (2u - 5)(2u + 5)	6. $z^2 + 8z - 48 (z + 12)(z - 4)$
7. $4x^2 + 28x + 48 \frac{4(x + 3)(x + 4)}{2}$	8. $3x^3 + 6x^2 - 105x \frac{3x(x + 7)(x - 5)}{3x(x + 7)(x - 5)}$
9. 8s ² + 2s - 3 (4s + 3)(2s - 1)	10. 5b ² - 17b - 12 (b - 4)(5b + 3)

Possible Journal Answers

- 1. Division problems can be changed into multiplication problems. For example, $\frac{6}{2} = 3$ can be written as $6 = 2 \cdot 3$. Now, let $\frac{2}{0} = n$. As a multiplication problem, this would be $2 = n \cdot 0$, but any number times zero is equal to zero, and therefore, there is no value of *n* that makes this true. This expression, $\frac{2}{0}$, is undefined.
- 2. The denominator of a rational expression cannot have a value of zero. When negative three is substituted for the x in x + 3, it becomes -3 + 3 = 0. Therefore, negative three is excluded from the domain of $\frac{2x}{x+3}$.
- 3. Find the restricted values of $\frac{3x+1}{x^2-8x+12}$ by setting the denominator equal to zero; $x^2 - 8x + 12 = 0$. First, factor $x^2 - 8x + 12$ to be (x - 6)(x - 2). Then, solve the equation (x - 6)(x - 2) = 0 by setting each factor equal to zero and solving for x: x - 6 = 0 and x - 2 = 0. The restricted values are six and two.
- 4. The value of the expression (x a)(x b) is zero when x equals either a or b. Let a = -2and b = 4. This gives (x - (-2))(x - 4) or (x + 2)(x - 4). The expression $\frac{x^3 - 5x}{(x + 2)(x - 4)}$ has the restricted values negative two and four.
- 5. Substitute zero for x to get $\frac{6(0)}{0-2} = \frac{0}{-2} = 0$. Zero is not a restricted value. Only the number two would make the value of the denominator zero. So, two is the only restricted value in this expression. When the numerator of a rational expression has a value of zero, the value of the expression is zero except when the denominator is zero; in which case, the expression is undefined.

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Module 15 Lesson 1