Assignments

* Worksheet: Simplifying Rational Expressions *(12 points)* One Note - Unit 7
* IXL: Algebra 1 - GG 3: Simplify Rational Expressions *(10 points)*

Last Tuesday's Warm-up

Solve for x. Show work.

$$\frac{(2x-3)}{4x} = \frac{(x-1)}{x}$$

$4x^2-4x = 2x^2-3x$

$-2x^2+3x \quad -2x^2+3x$

$2x^2-x=0$

$x(2x-1)=0$

$x=0$ extraneous

$2x-1=0$

$+1 \quad +1$

$\frac{2x}{2}=\frac{1}{2}$

$x=\frac{1}{2}$

Warm-up

Simplify the expression:

$$\frac{3x^2}{6xy}$$

$$\frac{1}{2}\cdot\frac{x}{1}\cdot\frac{1}{y}=\frac{x}{2y}$$

Simplifying Rational Expressions

11.4

Simplify the following expressions.

1. $\frac{48x^2}{8} = \frac{6x^2}{1} = 6x^2$

2. $\frac{6x}{30} = \frac{1x}{5} = \frac{x}{5}$

3. $\frac{11x^5y^2}{30x^2y^6} = \frac{2x^3}{5y^6}$

Rational Numbers and Rational Expressions:

- A *rational number* is a number that can be written as the quotient of two integers.
  - Examples: $\frac{1}{5}$, $\frac{8}{3}$, and $\frac{9}{1}$
- A *rational expression* is a fraction whose numerator, denominator, or both numerator and denominator are nonzero polynomials.
  - Examples: $\frac{7}{x+1}$, $\frac{5x}{x^2-16}$, and $\frac{6x+1}{x^2+3}$
- A rational expression is undefined when the denominator is equal to zero.
- To simplify a fraction, you factor the numerator and the denominator. Then divide out any common factors. A rational expression is simplified it its numerator and denominator have no factors in common (other than 1 or -1).

For what values of the variable is the rational expression undefined?

4. $\frac{7}{x+5}$

$x+5=0$
$-5 \quad -5$
$x=-5$

5. $\frac{x+9}{x^2-4}$

$(x+2)(x-2)$
$x+2=0 \quad x-2=0$
$-2 \quad -2 \quad +2 \quad +2$
$x=\pm 2$

6. $\frac{x-1}{x^2-x-30}$

$(x-6)(x+5)$
$x-6=0 \quad x+5=0$
$+6 \quad +6 \quad -5 \quad -5$
$x=6, -5$

Simplify the following rational expressions.

7. $\frac{4x}{2(x+3)}$

$\frac{2x}{(x+3)}$

8. $\frac{x(x^2+5)}{x^2}$

$\frac{(x^2+5)}{x}$

9. $\frac{(x+7)}{x}$

Cannot be simplified

10. $\frac{15x}{5x-10}$

$\frac{3\cancel{15}x}{\cancel{5}(x-2)}$ $\frac{3x}{1(x-2)}$

11. $\frac{x^2-9}{2x+6}$

$\frac{(x+3)(x-3)}{2(x+3)}$ $\frac{x-3}{2}$

12. $\frac{x+1}{x^2+4x+3}$

$\frac{(x+1)}{(x+1)(x+3)}$ $\frac{1}{x+3}$

13. $\frac{4x^2+8x+4}{5x^2+10x+5}$

$\frac{4(x^2+2x+1)}{5(x^2+2x+1)}$ $\frac{4}{5}$

14. $\frac{x^3-x}{x^3+5x^2-6x}$

$\frac{x(x^2-1)}{x(x^2+5x-6)}$ $\frac{(x+1)(x-1)}{(x+6)(x-1)} = \frac{x+1}{x+6}$

15. $\frac{3x^2-11x+10}{x^2-4}$

$3x^2-5x-6x+10$

$x(3x-5)-2(3x-5)$

$\frac{(3x-5)(x-2)}{(x+2)(x-2)}$ $\frac{3x-5}{x+2}$

16. $\frac{3x^2}{6xy}$

$\frac{x}{2y}$

17. $\frac{2x^2}{x(x+3)}$

$\frac{2x}{(x+3)}$

18. $\frac{x^2+6x+9}{x^2-9}$

$\frac{(x+3)(x+3)}{(x+3)(x-3)}$ $\frac{x+3}{x-3}$

19. $\frac{6x^2-24}{3x+6} = \frac{6(x^2-4)}{3(x+2)} = \frac{2\cancel{6}(x+2)(x-2)}{1\cancel{3}(x+2)} = \frac{2(x-2)}{1}$

$= \boxed{2(x-2)}$ *leave factored

Assignments

One Note

* Worksheet: Simplifying Rational Expressions *(12 points)*
* IXL: Algebra 1 - GG 3: Simplify Rational Expressions *(10 points)* Smart Score 10
* **IXL: Algebra 1 - AA 8 *(5 points)*** ✓
* **Keystone Practice Packet - multiple choice *(20 points)*** Forms Quiz