U1D4_T Multiplying and Dividing Rational Expressions

Sunday, February 3, 2019 7:55 PM

U1D4_T Multiplyin...

U1D4 Warm-Up:

Simplify. $\dfrac{-4x^2y^2-4xy^3}{12x^4y+12x^3y^2}$

$$= \frac{-4xy^2\cancel{(x+y)}}{12x^3y\cancel{(x+y)}}$$

$x+y\neq 0$

$x\neq -y$

$$= \frac{-y}{3x^2},\ x\neq 0, y\neq 0, x\neq -y$$

$\dfrac{4x^2-25}{2x^2-3x-5}$

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

$$= \frac{2x+5}{x+1},\ x\neq \frac{5}{2}, -1$$

restrict's

$2x-5\neq 0$

$2x\neq 5$

$x\neq \frac{5}{2}$

MCR 3UI <u>Multiplying and Dividing Rational Expressions</u>

We multiply and divide rational expressions using the same rules that we do with fractions.

When Multiplying, multiply numerators together and denominators together and then reduce to simplify. You could also cross reduce and then multiply to make your math easier!

ex. $\frac{1}{2} \times \frac{4}{5} = \frac{4}{10} = \frac{2}{5}$ or $\frac{1}{1} \times \frac{2}{5} = \frac{2}{5}$

When Dividing, multiply by the reciprocal!

Ex. $\frac{1}{2} \div \frac{4}{5}$

$= \frac{1}{2} \times \frac{5}{4}$

$= \frac{5}{8}$

Examples: State restrictions and simplify.

(a) $\frac{3a^3}{2b^2} \times \frac{10b^2}{9a^2}$

$= \frac{30a^3b^2}{18a^2b^2}$

$= \frac{5a}{3}, a,b \neq 0$

OR

$\frac{\cancel{3}^{1}\cancel{a^3}^{a}}{\cancel{2b^2}_{1}} \times \frac{\cancel{10}^{5}\cancel{b^2}}{\cancel{9}_{3}\cancel{a^2}_{1}}$

$= \frac{5a}{3}, a,b \neq 0$

(b) $\frac{y^3}{6} \div \frac{y^2}{-3}$

$= \frac{y^3}{6} \times \frac{-3}{y^2}$

$= \frac{-3y^3}{6y^2}$

$= \frac{-y}{2}, y \neq 0$

(c) $\frac{6m^3}{m+3} \times \frac{5m+15}{8m^3}$

$= \frac{\cancel{6}^{3}\cancel{m^3}^{1}}{\cancel{m+3}_{1}} \times \frac{5\cancel{(m+3)}^{1}}{\cancel{8}_{4}\cancel{m^3}_{1}}$

$= \frac{15}{4}, m \neq -3, 0$

restriction work:

$m+3 \neq 0$

$m \neq -3$

(d) $\frac{12a^2-19a+5}{4a^2-9} \div \frac{3a-1}{2a-3}$

$= \frac{12a^2-19a+5}{4a^2-9} \times \frac{2a-3}{3a-1}$

$= \frac{(4a-5)\cancel{(3a-1)}^{1}}{\cancel{(2a-3)}_{1}(2a+3)} \times \frac{\cancel{(2a-3)}^{1}}{\cancel{(3a-1)}_{1}}$

$= \frac{4a-5}{2a+3}, a \neq \pm\frac{3}{2}, \frac{1}{3}$

M 60
A -19
-15, -4
-5 -1

same as

$\frac{(4a-5)(3a-1)(2a-3)}{(2a-3)(2a+3)(3a-1)}$

restriction work:

$2a-3 \neq 0$
$2a \neq 3$
$a \neq \frac{3}{2}$

$3a-1 \neq 0$
$3a \neq 1$
$a \neq \frac{1}{3}$

$2a+3 \neq 0$
$2a \neq -3$
$a \neq \frac{-3}{2}$

(e) $\frac{6x^2-7xy+2y^2}{5x^2-3xy-2y^2} \times \frac{5x^2+22xy+8y^2}{2x^2+7xy-4y^2}$

$$= \frac{(3x-2y)\cancel{(2x-y)}\cancel{(5x+2y)}\cancel{(x+4y)}}{\cancel{(5x+2y)}(x-y)\cancel{(2x-y)}\cancel{(x+4y)}}$$

$$= \frac{3x-2y}{x-y}, \quad x \neq \frac{-2y}{5}, y, \frac{y}{2}, -4y$$

m 12
A −7
−3, −4

$6x^2-3xy-4xy+2y^2$
$= 3x(2x-y)-2y(2x-y)$
$= (3x-2y)(2x-y)$

restriction work:

$5x+2y \neq 0$
$5x \neq -2y$
$x \neq \frac{-2y}{5}$

$x-y \neq 0$
$x \neq y$

$2x-y \neq 0$
$2x \neq y$
$x \neq \frac{y}{2}$

$x+4y \neq 0$
$x \neq -4y$

QUIZ NEXT DAY

U1D4 HW: Pgs. 50-51 #1ac, 2ace, 3ace, 4ace, 5ace, 6aceg, 7ace, 8ac (eoo for 1-8), 9