Algebra 2 Name Cornely ID: 1

8.1 Multiplying and Dividing Rational Expressions Date _____ Period ____

Simplify each and state the excluded values.

1) Factor all numerators and denominators
2) Cancel any common factors
3) State the excluded values
*** An excluded value is a number that makes the denominator = 0**
*** These come from the factored form of the denominator**

EXAMPLES:

1) $\frac{n+5}{n^2-2n-35}$

Factor: $\frac{n+5}{(n-7)(n+5)}$

cancel

$n \neq 7$ $n \neq -5$ ← excluded values

$\frac{1}{n-7}$; $n \neq 7, -5$

2) $\frac{x-4}{9x-36} = \frac{x-4}{9(x-4)}$

$x \neq 4$

$\frac{1}{9}$; $x \neq 4$

3) $\frac{1}{8x-72} \cdot \frac{8x-72}{7x}$

$8x-72=0$ $7x=0$

$8x=72$ $x \neq 0$

$x \neq 9$

$\frac{1}{7x}$; $x \neq 0, 9$

4) $\frac{1}{x+9} \cdot \frac{x^2+6x-27}{6x+42}$

$\frac{1}{x+9} \cdot \frac{(x+9)(x-3)}{6(x+7)}$

$x \neq -9$ $x \neq -7$

$\frac{(x-3)}{6(x+7)}$; $x \neq -9, -7$

5) $\dfrac{\dfrac{1}{a+1}\cdot}{\dfrac{a-8}{a^2+a-72}}$

we do not ÷ by fractions, we multiply by the reciprocal

$$\frac{1}{a+1}\cdot\frac{a^2+a-72}{a-8}$$

$$\frac{1}{(a+1)}\cdot\frac{(a+9)(a-8)}{(a-8)}$$

$a+1$: $a\neq -1$; $a-8$: $a\neq 8$; $a+9$: $a\neq -9$

$$\boxed{\frac{a+9}{a+1};\ a\neq -9,-1,8}$$

6) $\dfrac{v^2-11v+10}{8}\div\dfrac{v^2-18v+80}{v-8}$

$$\frac{v^2-11v+10}{8}\cdot\frac{v-8}{v^2-18v+80}$$

$$\frac{(v-10)(v+1)}{8}\cdot\frac{v-8}{(v-10)(v-8)}$$

$v-10$: $v\neq 10$; $v-8$: $v\neq 8$

$$\boxed{\frac{v+1}{8};\ v\neq 8,10}$$

* for division problems

* excluded values come from the denominator of the first fraction and the numerator and denominator of the fraction you are dividing by.