Simplifying Rational Expressions Notes

Things to know:

1) ***Make sure all fractions are <u>completely</u> simplified.***
2) ***Excluded values are any restrictions on the domain of the function (what makes your denominator = 0).***

For each example, simplify and state the excluded values.

1) $-\frac{90n^2}{30n^4}$

$-\frac{3}{n^2}$, $n \neq 0$

2) $\frac{35v^4}{28v^2}$

$\frac{5v^2}{4}$, $v \neq 0$

3) $-\frac{80r^8}{70r^5}$

$-\frac{8r^3}{7}$, $r \neq 0$

Sometimes simplifying might involve factoring. Check for a GCF first!

4) $\frac{25b-10}{35}$

$\frac{5(5b-2)}{35} = \boxed{\frac{5b-2}{7}}$

no excluded values

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

$x-3 \rightarrow x-3 \rightarrow x-3$

$3-x = -x+3 \rightarrow -1(x-3)$

$\frac{5(x-3)}{-1(x-3)} = \boxed{-5,\ x \neq 3}$

6) $\frac{35v}{35v^2-20v}$

$\frac{35v}{5v(7v-4)}$

$\boxed{\frac{7}{7v-4},\ v \neq 0, \frac{4}{7}}$

If a GCF isn't found or doesn't fully simplify the function, other methods of factoring might be needed such as factoring a trinomial.

7) $\frac{7k+70}{k^2+18k+80}$

$\frac{7(k+10)}{(k+10)(k+8)}$

$\boxed{\frac{7}{k+8},\ k \neq -10, -8}$

8) $\frac{56a^2-40a}{40a^2+40a}$

$\frac{8a(7a-5)}{40a(a+1)}$

$\boxed{\frac{7a-5}{5(a+1)},\ a \neq 0, -1}$

9) $\frac{n^2-4n-60}{n^2-12n+20}$

$\frac{(n-10)(n+6)}{(n-10)(n-2)}$

$\boxed{\frac{n+6}{n-2},\ n \neq 10, 2}$