

Simplifying Rational Variable Expressions

A Rational Variable Expression (RVE) is an expression of the form $\frac{f(x)}{g(x)}$ where $f(x)$ and $g(x)$ are polynomials

and $g(x) \neq 0$. (restriction on denominator since we can't divide by zero)

Note: $f(x)$ is read as "f at x" and represents a function in terms of x

eg. $y = x^2$ can also be written as $f(x) = x^2$

$y = f(x) \rightarrow$ same

Restr
X=
means
can not

Eg Simplify and state restrictions.

$$1) \frac{3bx^2}{-bx}$$

$$= -bx$$

* For an RVE with a monomial top & bottom simply divide using exponent rules

Restrictions:

$$x \neq 0$$

means x can not equal 0

* Restrictions involve stating what value(s) x can not be so the denominator is not zero.

$$\frac{(4y+1)}{4y}$$

* can not cancel 4y terms

$$2) \frac{25x^2 + 10x + 5}{5}$$

$$= 5x^2 + 2x + 1$$

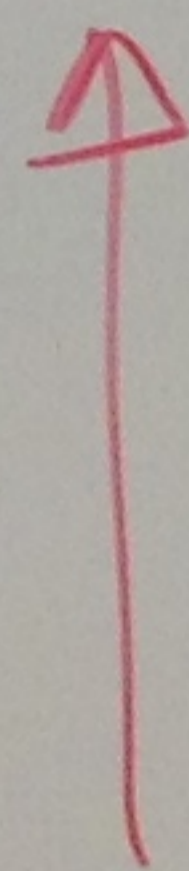
} Divide 5 in to each term in the numerator.

* No restrictions in this case since there is no variable in the denominator.

Quiz



Worksheet



HW
#1-8
(odd letters)

erator.

$$3) \frac{10x+12}{-15x-18}$$

* Factor each expression first

$$= \frac{2(5x+6)}{-3(5x+6)}$$

* Divide (cancel) factors that are the same top & bottom.

$$= \frac{2}{-3}$$

For restrictions:
 → set each factor in the denominator (that contains the variable) "not" equal to zero and solve for x.

Restrictions:

$$5x+6 \neq 0$$

$$5x \neq -6$$

$$x \neq -\frac{6}{5}$$

$$4) \frac{y^2+y-20}{-4y+16}$$

Factor first!

$$= \frac{(y+5)(y-4)}{-4(y-4)}$$

Divide factors that are the same.

$$= \frac{y+5}{-4}$$

Restrictions:

$$y-4 \neq 0$$

$$y \neq 4$$