

Pre Calc 11 Final Review Chp 7

Note Title

2016-05-25

7.1) Equivalent Rational Expressions.

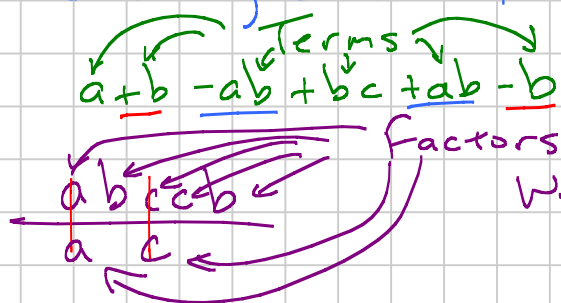
Equiv Exp. look different, but produce the same value for the same input in both exp. for ALL input.

eg) $\frac{2}{x} \neq \frac{4x}{2x^2}$ are equiv b/c $D: x \neq 0$ for both.

eg) $\frac{2x}{3} \neq \frac{4x^2}{6x}$ not equiv, but we can make them equiv by restricting the domain for both.
 $D: x \neq 0$

We can make equiv exp by multiplying factor or factor

cancelling common factor pairs in numerator & denominator.



are separated by '+' or '-'

We can cancel opposite terms

Factors are separated by '.' or ':'

We can cancel factor pairs in numer. & denom.

For rational exp, we need to factor the numer & denom before cancelling.

NPV's are the zeroes of the denom b/c we can't divide by zero. Always state the NPV's or domain.

7.2) Dividing Rational Expr, we only reciprocate and multiply for a single rational unless there are brackets. eg) $\frac{a}{b} \div \frac{c}{d} \cdot \frac{e}{f} = \frac{a}{b} \cdot \frac{d}{c} \cdot \frac{e}{f}$ ← new NPV's.

$$\frac{a}{b} \div \left(\frac{c}{d} \cdot \frac{e}{f} \right) = \frac{a}{b} \cdot \frac{d}{c} \cdot \frac{f}{e}$$

7.3) Adding & Subtracting R Expr.

When add/sub R Expr (terms), we need common denom. Find missing factors from other denom.

eg) $\frac{a}{bf} + \frac{c}{df} + \frac{e}{b} = \frac{a}{bf} \frac{d}{d} + \frac{c}{df} \frac{b}{b} + \frac{e}{b} \frac{df}{df}$

LCD: bdf

$a-f$ can be monomials or binomials.

7.4) A/S R Exps with Polynomial Denominators
 Factor R Exps first (numer & denom)
 Then same as 7.3.

7.5) Solving R Equations

We are adding "=" to R Exps.

If "ALL" denominators are the same then we can cancel them all out (can't do this with R Exps).

Check solutions against NPV's for extraneous.

7.6) Applications of R Eqns.

Copy formulas from notes.

Simplified equation for work-rate.

$$\text{Rate}_{\text{tot}} - \text{Rate}_{p_1} = \text{Rate}_{p_2} \quad \text{Rate}_{\text{tot}} = \text{Rate}_{p_1} + \text{Rate}_{p_2}$$

eg) P. 598 Q 6.

6. Jenny can clean out the garage in 5 h. When her son helps, they can clean out the garage in 3 h. How long would it take Jenny's son to clean out the garage on his own? X

$$\frac{1 \text{ gar}}{3 \text{ hrs}} - \frac{1 \text{ gar}}{5 \text{ hrs}} = \frac{1 \text{ gar}}{x \text{ hrs}}$$

$$\frac{1}{3} - \frac{1}{5} = \frac{1}{x} \quad \text{LCD: } 15x$$
~~$$\frac{1}{3} \frac{5x}{5x} - \frac{1}{5} \frac{3x}{3x} = \frac{1}{x} \frac{15}{15}$$~~

$$5x - 3x = 15$$

$$2x = 15$$

$$x = 15/2 \text{ hrs}$$

10. It takes Marcy's apprentice 9 h longer to build a deck than it takes Marcy, an experienced carpenter. When they work together, they can build the deck in 20 h. How long would it take each person to build the deck working alone?

$$\frac{1 \text{ deck}}{20 \text{ hrs}} - \frac{1 \text{ deck}}{x \text{ hrs}} = \frac{1 \text{ deck}}{(x+9) \text{ hrs}}$$
~~$$\frac{1}{20} \frac{x(x+9)}{x(x+9)} - \frac{1}{x} \frac{20(x+9)}{20(x+9)} = \frac{1}{(x+9)} \frac{20x}{20x}$$~~

$$\text{LCD: } 20x(x+9)$$

$$x^2 + 9x - (20x + 180) = 20x$$

$$x^2 - 31x - 180 = 0 \Rightarrow (x-36)(x+5) = 0$$

$x = 36 \text{ hrs}$ $x+9 = 45 \text{ hrs}$
 $x = -5$ is extraneous