÷ Non-permissible values & simplifying

Date _____ Topic 1/4

CUES · QUESTIONS

1. Where do NPVs come from?
2. $\frac{x-7}{7-x}$ = ?
3. Can you cancel the x in $\frac{x+2}{x}$?
4. NPVs of $\frac{1}{x^2+4}$?

Cover the notes. Answer each cue from memory.

NOTES

1 · Worked example Copy one example from the page. Next to each line write WHY in a few words.

2 · Fill in the blanks Cover the steps and redo it. Leave a gap where you are unsure.

3 · Your turn A new question. Then check it against the answer.

SUMMARY — IN MY OWN WORDS, TWO SENTENCES

CUES · QUESTIONS

1. Dividing rational expressions: first move?
2. Can a top cancel with a bottom of the OTHER fraction?
3. $\frac{x}{3} \div \frac{x}{6}$ = ?
4. Why factor before multiplying?

Cover the notes. Answer each cue from memory.

NOTES

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SUMMARY — IN MY OWN WORDS, TWO SENTENCES

CUES · QUESTIONS

1. LCD of $(x-1)(x+2)$ and $(x+2)^2$?
2. Subtracting a fraction — what do you put around its numerator?
3. $\dfrac{4}{x-5} - \dfrac{3}{5-x}$ = ?
4. Last step after combining?

Cover the notes. Answer each cue from memory.

NOTES

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SUMMARY — IN MY OWN WORDS, TWO SENTENCES

÷ Rational equations & applications

Date _____ Topic 4/4

CUES · QUESTIONS

1. First line of every rational equation?
2. Rate of someone who finishes a job in 5 h?
3. All your answers are NPVs. Conclusion?
4. Boat speed v in still water, current 2 km/h. Upstream speed?

Cover the notes. Answer each cue from memory.

NOTES

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3 · Your turn A new question. Then check it against the answer.

SUMMARY — IN MY OWN WORDS, TWO SENTENCES

÷ Rational Expressions & Equations · Formula and trap sheet

Everything you need before a test, on the fewest pages. Fold it and keep it in your binder.

Non-permissible values & simplifying

FORMULAS

$\frac{AC}{BC} = \frac{A}{B}, \quad B \neq 0,\ C \neq 0$ — Cancelling a common factor

$\frac{a-b}{b-a} = -1, \quad a \neq b$ — Opposite factors

REMEMBER

- NPVs: values that make the DENOMINATOR zero — factor it, set each factor $\neq 0$.
- State NPVs from the ORIGINAL expression; a cancelled factor still counts.

WATCH OUT

- $\frac{x+6}{x+3} = \frac{6}{3}$ × → nothing cancels across $+$.
- Setting the numerator $= 0$ for NPVs × → only the denominator matters.

Multiplying & dividing

FORMULAS

$\frac{A}{B} \cdot \frac{C}{D} = \frac{AC}{BD}$ — Multiplying $(B, D \neq 0)$

$\frac{A}{B} \div \frac{C}{D} = \frac{A}{B} \cdot \frac{D}{C}$ — Dividing $(B, C, D \neq 0)$

REMEMBER

- Multiply: factor everything, cancel any top with any bottom, then multiply what is left.
- Divide: multiply by the reciprocal of the SECOND fraction.

WATCH OUT

- In $\div \frac{x-5}{x+1}$, forgetting $x \neq 5$ × — it lands on the bottom after flipping.
- Cancelling across $+$: in $\frac{x+3}{x}$ nothing cancels.

Adding & subtracting

FORMULAS

$\frac{A}{B} \pm \frac{C}{D} = \frac{AD \pm BC}{BD}$ — Adding/subtracting (use the LCD when the denominators share factors)

REMEMBER

- Factor every denominator; LCD = each different factor at its highest power.
- Rewrite over the LCD, then add or subtract the NUMERATORS only.

WATCH OUT

- $\frac{1}{x} + \frac{1}{y} = \frac{2}{x+y}$ × → $\frac{x+y}{xy}$.
- $x - (x-2) = -2$ × → $+2$: the minus hits every term.

Rational equations & applications

FORMULAS

$\frac{1}{t_1} + \frac{1}{t_2} = \frac{1}{T}$ — Work together (time alone t_1, t_2; together T)

$t = \frac{d}{v}$ — Time = distance ÷ speed

REMEMBER

- NPVs first; then multiply EVERY term (whole numbers too) by the LCD.
- An answer equal to an NPV is extraneous — reject it; all rejected → no solution.

WATCH OUT

- $1 + \frac{12}{x^2-4}$: the 1 stays 1 × → it becomes $x^2 - 4$.
- Together time $= t_1 + t_2$ × → add the RATES; together is faster than either alone.