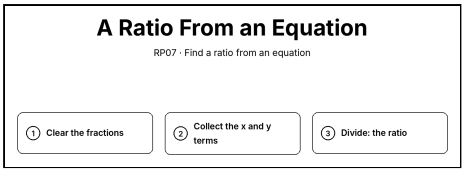
A Ratio From an Equation: teacher script

RP07-V1 · RP07 Find a ratio from an equation · teachers only. Without a screen, read each Say line and draw each Draw step on the board. About 79 seconds as a video.

01



Say. A ratio from an equation. Clear the fractions. Collect the x terms on one side and the y terms on the other. Then divide to get the ratio.

Draw. Write the title “A Ratio From an Equation” and the steps: 1. Clear the fractions; 2. Collect the x and y terms; 3. Divide: the ratio.

02

$$\frac{10x-3y}{13x-2y}=\frac{3}{5}.\ \text{Find}\ \frac{x}{y}.$$

Say. 10x − 3y over 13x − 2y equals three fifths. Find x over y.

Draw. Clear the board. Write “(10x − 3y)/(13x − 2y) = 3/5. Find x/y.” in a box at the top.

03

$$\frac{10x-3y}{13x-2y}=\frac{3}{5}.\ \text{Find}\ \frac{x}{y}.$$

$$5(10x-3y)=3(13x-2y)\quad\text{cross-multiply}$$

Say. Cross-multiply: 5 times the whole top, and 3 times the whole bottom.

Draw. Write 5(10x − 3y) = 3(13x − 2y) on the next line. Beside it, write “cross-multiply”.

04

$$\frac{10x-3y}{13x-2y}=\frac{3}{5}.\ \text{Find}\ \frac{x}{y}.$$

$$5(10x-3y)=3(13x-2y)\quad\text{cross-multiply}$$

$$50x-15y=39x-6y$$

Say. Multiply every term: 50x − 15y = 39x − 6y.

Draw. Write 50x − 15y = 39x − 6y on the next line.

05

$$\frac{10x-3y}{13x-2y}=\frac{3}{5}.\ \text{Find}\ \frac{x}{y}.$$

$$5(10x-3y)=3(13x-2y)\quad\text{cross-multiply}$$

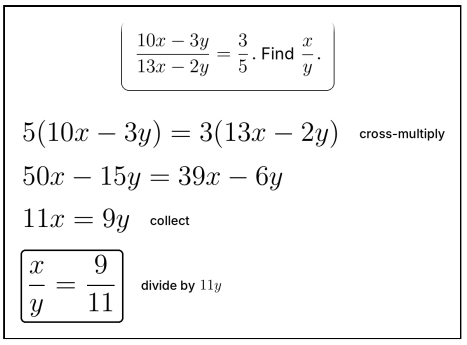
$$50x-15y=39x-6y$$

$$11x=9y\quad\text{collect}$$

Say. Collect: take 39x from both sides, and add 15y. 11x = 9y.

Draw. Write 11x = 9y on the next line. Beside it, write “collect”.

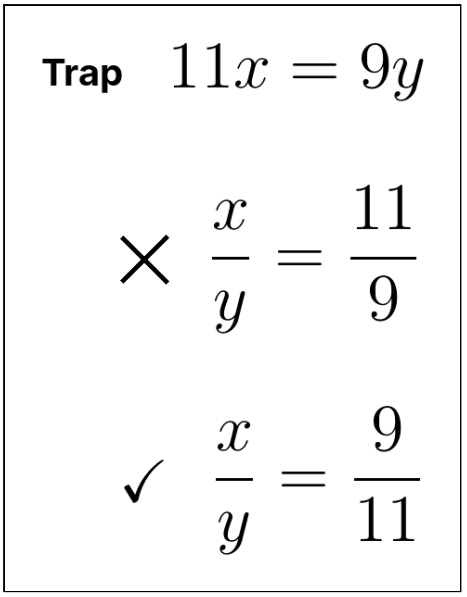
06



Say. Divide both sides by 11y: x over y is nine elevenths.

Draw. Write x/y = 9/11 and box it on the next line. Beside it, write “divide by 11y”.

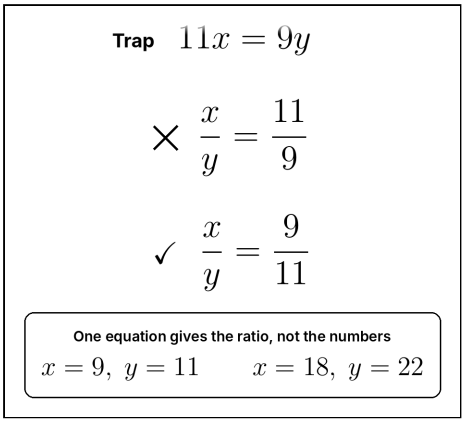
07



Say. Watch for the trap: turning the ratio upside down. In 11x = 9y, the 9 goes with x, so x over y is nine elevenths.

Draw. Clear the board. Write “Trap” and 11x = 9y. Below, write x/y = 11/9 and cross it out ×. Then write x/y = 9/11 with a tick ✓.

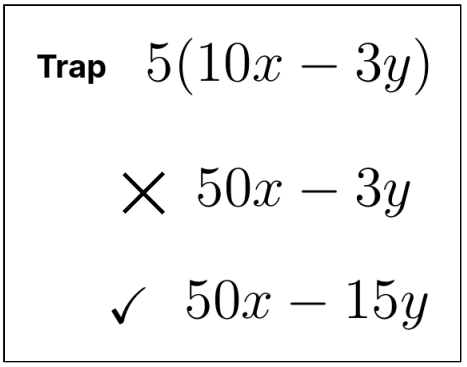
08



Say. One equation gives the ratio, not the numbers. 9 and 11 work, and so do 18 and 22.

Draw. Write the rule in a box: x = 9, y = 11 x = 18, y = 22.

09



Say. And don't multiply only the first term: 5 times 10x − 3y is 50x − 15y. Multiply every term.

Draw. Clear the board. Write “Trap” and 5(10x − 3y). Below, write 50x − 3y and cross it out ×. Then write 50x − 15y with a tick ✓.

10

Your turn

Clear the fractions, collect, divide.
Watch which number goes with x.

Say. Now it is your turn. Clear the fractions, collect, and divide. And watch which number goes with x.

Draw. Point to today’s activity: Clear the fractions, collect, divide. Watch which number goes with x.