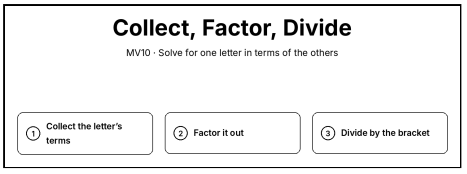
Collect, Factor, Divide: teacher script

MV10-V2 · MV10 Solve for one letter in terms of the others · teachers only. Without a screen, read each Say line and draw each Draw step on the board. About 69 seconds as a video.

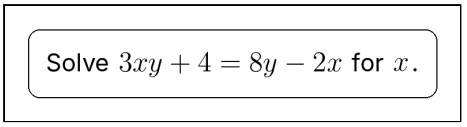
01



Say. Collect, factor, divide. When the letter is in more than one term, collect those terms on one side, factor the letter out, then divide by the bracket.

Draw. Write the title “Collect, Factor, Divide” and the steps: 1. Collect the letter’s terms; 2. Factor it out; 3. Divide by the bracket.

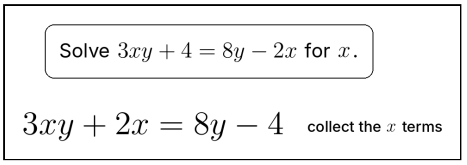
02



Say. Solve 3xy + 4 = 8y − 2x for x.

Draw. Clear the board. Write “Solve 3xy + 4 = 8y − 2x for x.” in a box at the top.

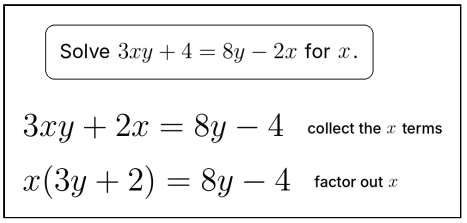
03



Say. Add 2x to both sides and subtract four: the x terms are now on the left.

Draw. Write 3xy + 2x = 8y − 4 on the next line. Beside it, write “collect the x terms”.

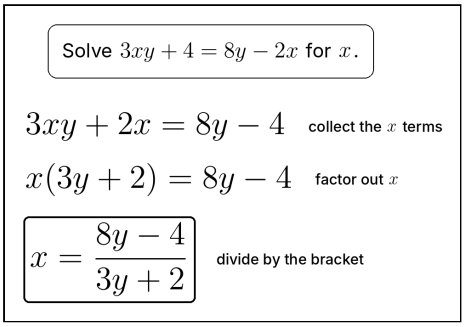
04



Say. Factor out x: x times 3y + 2.

Draw. Write x(3y + 2) = 8y − 4 on the next line. Beside it, write “factor out x”.

05



Say. Divide by the bracket: x equals 8y − 4, over 3y + 2.

Draw. Write x = (8y − 4)/(3y + 2) and box it on the next line. Beside it, write “divide by the bracket”.

06

Trap $3xy + 4 = 8y - 2x$

$$\times \quad x = \frac{8y - 4 - 2x}{3y}$$

$$\checkmark \quad x = \frac{8y - 4}{3y + 2}$$

Say. Watch for the trap: leaving x on both sides. That isn't solved yet. Collect the x terms first.

Draw. Clear the board. Write “Trap” and 3xy + 4 = 8y − 2x. Below, write x = (8y − 4 − 2x)/(3y) and cross it out ×. Then write x = (8y − 4)/(3y + 2) with a tick ✓.

07

Solve $ax + bc = 3c - 2d^2x$ for x.

Say. Now solve ax + bc = 3c − 2d²x for x.

Draw. Clear the board. Write “Solve ax + bc = 3c − 2d²x for x.” in a box at the top.

08

Solve $ax + bc = 3c - 2d^2x$ for x.

$ax + 2d^2x = 3c - bc$ collect

Say. Collect: add 2d²x to both sides and subtract bc.

Draw. Write ax + 2d²x = 3c − bc on the next line. Beside it, write “collect”.

09

Solve $ax + bc = 3c - 2d^2x$ for x.

$ax + 2d^2x = 3c - bc$ collect

$x(a + 2d^2) = 3c - bc$ factor

Say. Factor out x.

Draw. Write x(a + 2d²) = 3c − bc on the next line. Beside it, write “factor”.

10

Solve $ax + bc = 3c - 2d^2x$ for x.

$ax + 2d^2x = 3c - bc$ collect

$x(a + 2d^2) = 3c - bc$ factor

$\boxed{x = \frac{3c - bc}{a + 2d^2}}$ divide

Say. Divide by the whole bracket.

Draw. Write x = (3c − bc)/(a + 2d²) and box it on the next line. Beside it, write “divide”.

11

Trap $ax + bc = 3c - 2d^2x$

$\times$ $x(a - 2d^2) = 3c - bc$

✓ $x(a + 2d^2) = 3c - bc$

Say. Watch for the trap: keeping the sign when a term moves. Negative $2d^2x$ on the right becomes positive on the left.

Draw. Clear the board. Write “Trap” and $ax + bc = 3c - 2d^2x$. Below, write $x(a - 2d^2) = 3c - bc$ and cross it out ×. Then write $x(a + 2d^2) = 3c - bc$ with a tick ✓.

12

Your turn

Collect, factor,
and divide by the whole bracket

Say. Now it is your turn. Collect, factor, and divide by the whole bracket.

Draw. Point to today’s activity: Collect, factor, and divide by the whole bracket