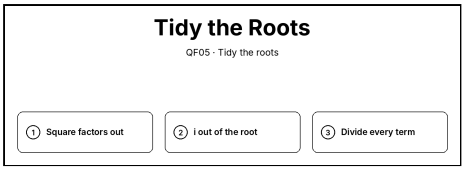
Tidy the Roots: teacher script

QF05-V1 · QF05 Tidy the roots · teachers only. Without a screen, read each Say line and draw each Draw step on the board. About 80 seconds as a video.

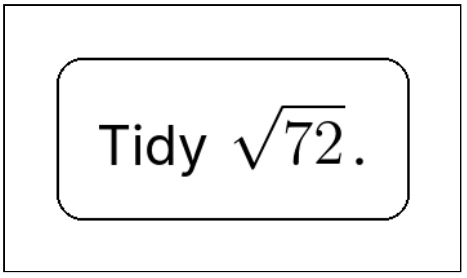
01



Say. Tidy the roots. Three moves: take square factors out of the root, take the i out of the root of a negative number, and divide every term by a number they share with the bottom.

Draw. Write the title “Tidy the Roots” and the steps: 1. Square factors out; 2. i out of the root; 3. Divide every term.

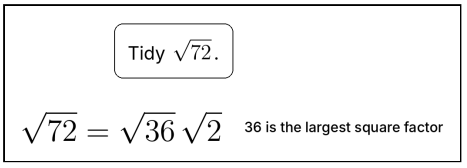
02



Say. Tidy root 72.

Draw. Clear the board. Write “Tidy √72.” in a box at the top.

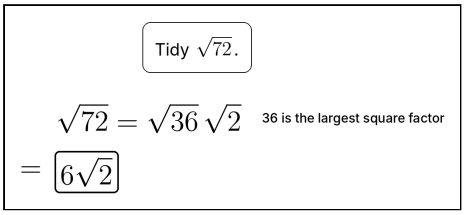
03



Say. 72 is 36 times 2, and 36 is a square: the largest square that divides 72.

Draw. Write √72 = √36 √2 on the next line. Beside it, write “36 is the largest square factor”.

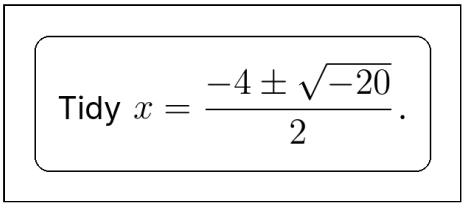
04



Say. So root 72 is 6 root 2.

Draw. Write = 6√2 and box it on the next line.

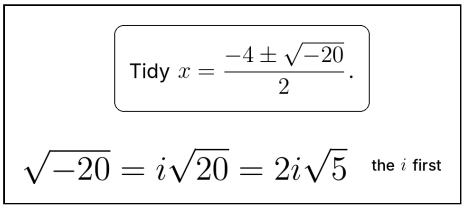
05



Say. Now tidy x equals negative 4, plus or minus root negative 20, all over 2.

Draw. Clear the board. Write “Tidy x = \dfrac−4 ± √(−20)2.” in a box at the top.

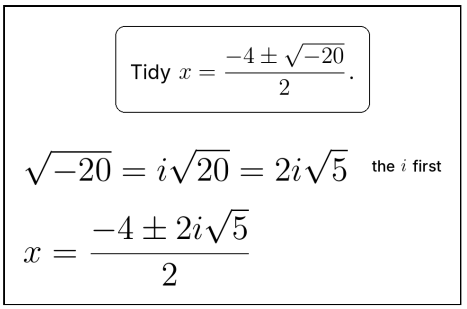
06



Say. The i comes out first: root negative 20 is i root 20, which is 2 i root 5.

Draw. Write √(−20) = i√20 = 2i√5 on the next line. Beside it, write “the i first”.

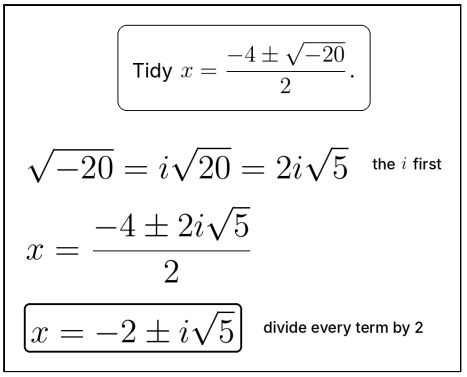
07



Say. So x is negative 4, plus or minus 2 i root 5, all over 2.

Draw. Write x = (−4 ± 2i√5)/2 on the next line.

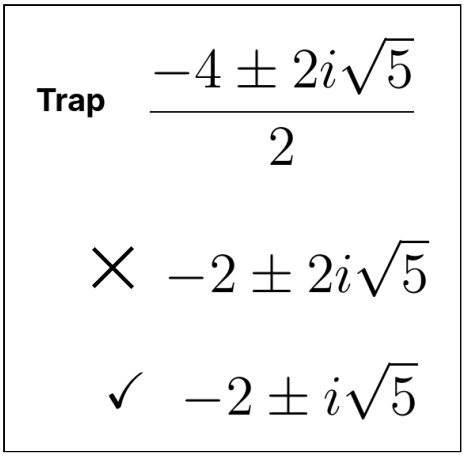
08



Say. Both terms on top can be divided by 2, so divide every term by 2: x equals negative 2, plus or minus i root 5.

Draw. Write x = −2 ± i√5 and box it on the next line. Beside it, write “divide every term by 2”.

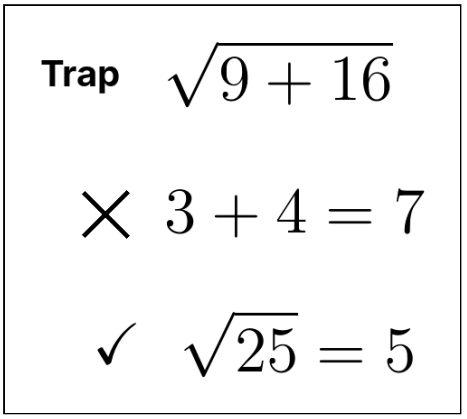
09



Say. Watch for the trap. Don't divide only the first term: divide every term, the root part too.

Draw. Clear the board. Write “Trap” and (−4 ± 2i√5)/2. Below, write −2 ± 2i√5 and cross it out ×. Then write −2 ± i√5 with a tick ✓.

10



Say. And a root doesn't split over a sum: the root of 9 plus 16 is not 3 plus 4. Add first: root 25 is 5.

Draw. Clear the board. Write “Trap” and √(9 + 16). Below, write 3 + 4 = 7 and cross it out ×. Then write √25 = 5 with a tick ✓.

11

Your turn

Square factors out.

i out of the root.

Divide every term.

Say. Now it is your turn. Take square factors out, take the i out, and divide every term by the number they share with the bottom.

Draw. Point to today’s activity: Square factors out. i out of the root. Divide every term.