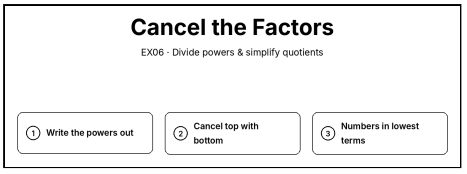
Cancel the Factors: teacher script

EX06-V1 · EX06 Divide powers & simplify quotients · teachers only. Without a screen, read each Say line and draw each Draw step on the board. About 92 seconds as a video.

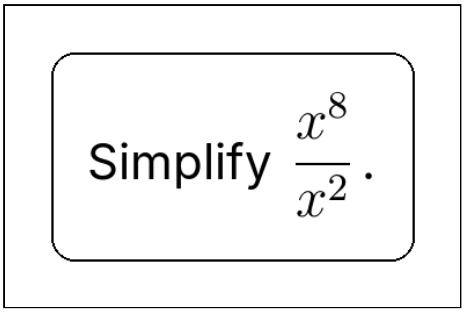
01



Say. Cancel the factors. To divide, write the powers out, then cancel each factor that is on the top and on the bottom. Put the numbers in lowest terms.

Draw. Write the title “Cancel the Factors” and the steps: 1. Write the powers out; 2. Cancel top with bottom; 3. Numbers in lowest terms.

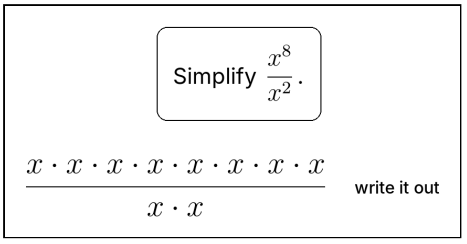
02



Say. Simplify x^8 over x^2.

Draw. Clear the board. Write “Simplify x^8/x^2.” in a box at the top.

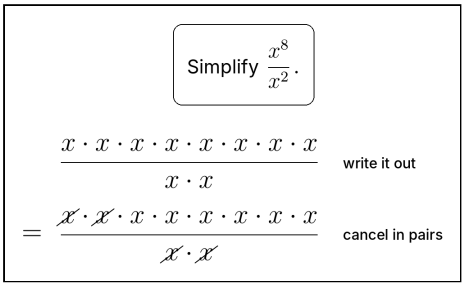
03



Say. Write it out: eight x’s on top, two underneath.

Draw. Write (x · x · x · x · x · x · x · x)/(x · x) on the next line. Beside it, write “write it out”.

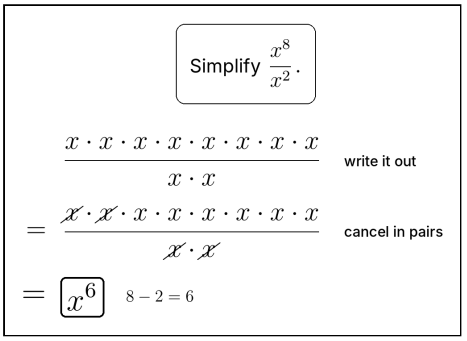
04



Say. Each x underneath cancels one on top.

Draw. Write = (~~x~~ · ~~x~~ · x · x · x · x · x · x)/(~~x~~ · ~~x~~) on the next line. Beside it, write “cancel in pairs”. Cross out the factors that cancel, one on top with one underneath.

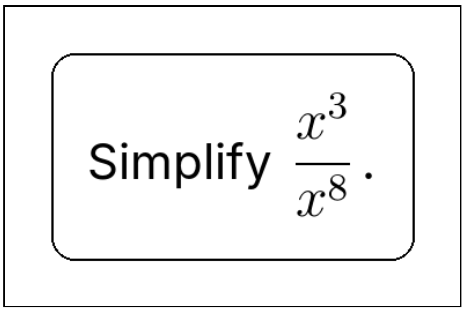
05



Say. Six are left on top: x^6. Eight take away two is six.

Draw. Write = x^6 and box it on the next line. Beside it, write “8 − 2 = 6”.

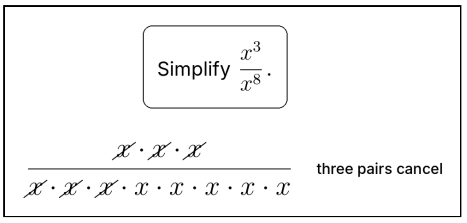
06



Say. Now the larger power is underneath: x^3 over x^8.

Draw. Clear the board. Write “Simplify x^3/x^8.” in a box at the top.

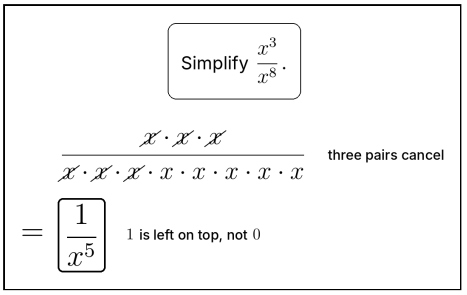
07



Say. All three x’s on top cancel.

Draw. Write (~~x~~ · ~~x~~ · ~~x~~)/(~~x~~ · ~~x~~ · ~~x~~ · x · x · x · x · x) on the next line. Beside it, write “three pairs cancel”. Cross out the factors that cancel, one on top with one underneath.

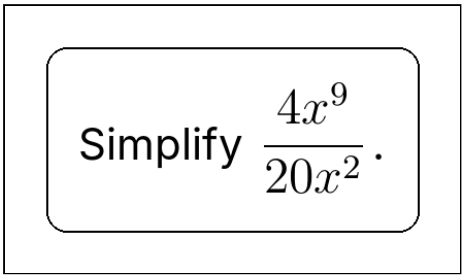
08



Say. Five are left underneath, and one is left on top, not zero: one over x^5.

Draw. Write = $1/x^5$ and box it on the next line. Beside it, write “1 is left on top, not 0”.

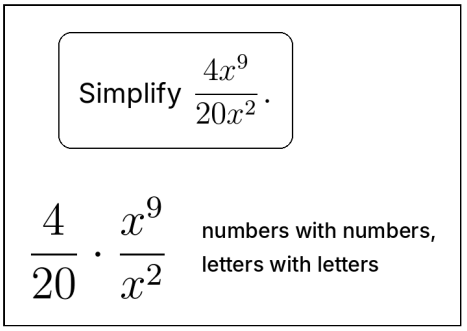
09



Say. One with numbers: $4x^9$ over $20x^2$.

Draw. Clear the board. Write “Simplify $4x^9/(20x^2)$.” in a box at the top.

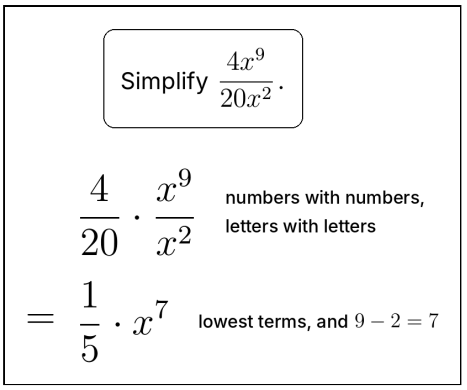
10



Say. Numbers with numbers, letters with letters.

Draw. Write $4/20 \cdot x^9/x^2$ on the next line. Beside it, write “numbers with numbers, letters with letters”.

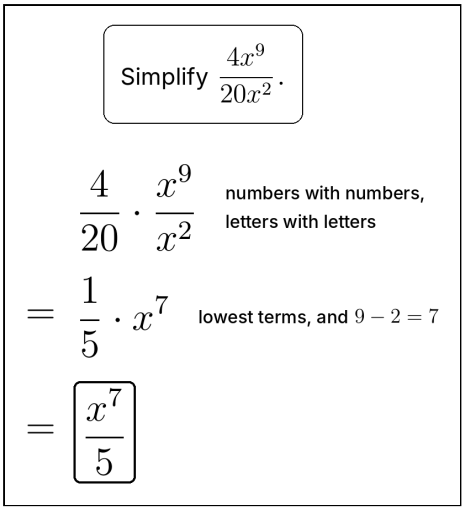
11



Say. Four twentieths is one fifth, and nine take away two is seven.

Draw. Write = 1/5 · x^7 on the next line. Beside it, write “lowest terms, and 9 − 2 = 7”.

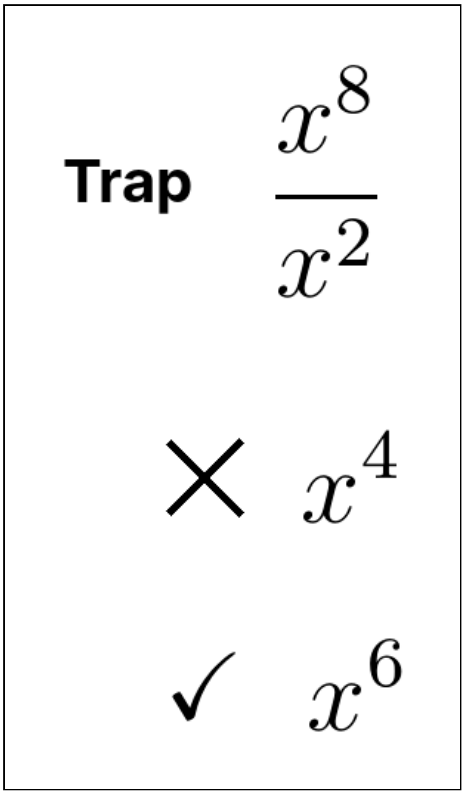
12



Say. So the answer is x^7 over five.

Draw. Write = $x^7/5$ and box it on the next line.

13



Say. Watch for the trap: dividing the exponents. x^8 over x^2 is not x^4. Subtract them: eight take away two, x^6.

Draw. Clear the board. Write “Trap” and x^8/x^2. Below, write x^4 and cross it out ×. Then write x^6 with a tick ✓.

14

Trap $\dfrac{3+2x}{5+3x}$

$$\times\ \frac{3+2\cancel{x}}{5+3\cancel{x}} = \frac{5}{8}$$

$$\checkmark\quad x=2:\quad \frac{7}{11} \neq \frac{5}{8}$$

Say. And only factors cancel. Here 3 + 2x is on top and 5 + 3x is underneath. Each x is part of a sum, so you can't cancel it. Try x = 2: you get seven elevenths, not five eighths.

Draw. Clear the board. Write "Trap" and (3 + 2x)/(5 + 3x). Below, write (3 + 2~~x~~)/(5 + 3~~x~~) = 5/8 and cross it out ×. Then write x = 2: 7/11 ≠ 5/8 with a tick ✓.

15

Your turn

Cancel factors on the top and the bottom, and subtract the exponents

Say. Now it is your turn. Cancel the factors on the top and the bottom, and subtract the exponents.

Draw. Point to today's activity: Cancel factors on the top and the bottom, and subtract the exponents