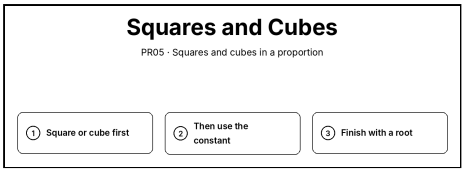
Squares and Cubes: teacher script

PR05-V1 · PR05 Squares and cubes in a proportion · teachers only. Without a screen, read each Say line and draw each Draw step on the board. About 73 seconds as a video.

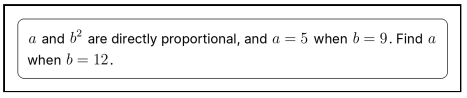
01



Say. Squares and cubes. When a square or a cube is in the proportion, square or cube first. Then use the constant. And if the unknown is squared, finish with a root.

Draw. Write the title “Squares and Cubes” and the steps: 1. Square or cube first; 2. Then use the constant; 3. Finish with a root.

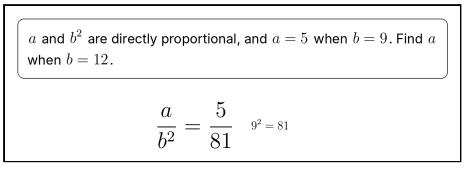
02



Say. a and b squared are directly proportional, and a is 5 when b is 9. Find a when b is 12.

Draw. Clear the board. Write “a and b² are directly proportional, and a = 5 when b = 9. Find a when b = 12.” in a box at the top.

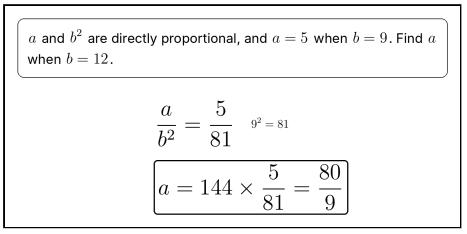
03



Say. Square b first: 9 squared is 81. So a over b squared is 5 over 81.

Draw. Write a/b² = 5/81 on the next line. Beside it, write “9² = 81”.

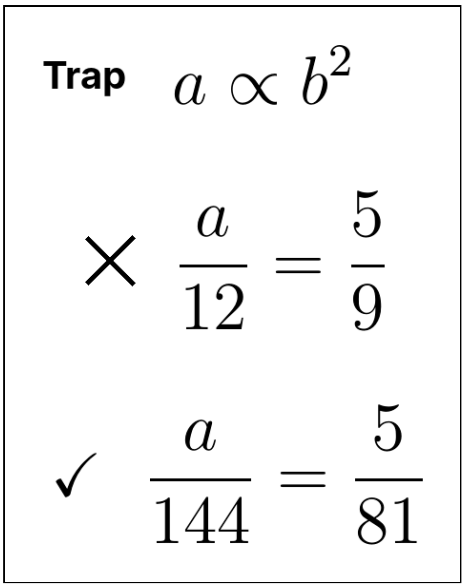
04



Say. 12 squared is 144, so a is 144 times 5 over 81, which is 80 over 9.

Draw. Write a = 144 × 5/81 = 80/9 and box it on the next line.

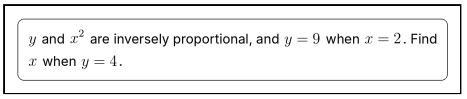
05



Say. Watch for the trap: using the number instead of its square. Use 144, not 12.

Draw. Clear the board. Write “Trap” and a \propto b². Below, write a/12 = 5/9 and cross it out ×. Then write a/144 = 5/81 with a tick ✓.

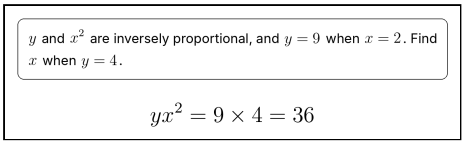
06



Say. y and x squared are inversely proportional, and y is 9 when x is 2. Find x when y is 4.

Draw. Clear the board. Write “y and x² are inversely proportional, and y = 9 when x = 2. Find x when y = 4.” in a box at the top.

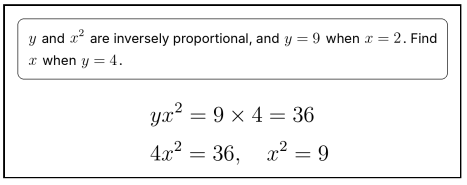
07



Say. The product stays the same: y times x squared is 9 times 4, that is 36.

Draw. Write yx² = 9 × 4 = 36 on the next line.

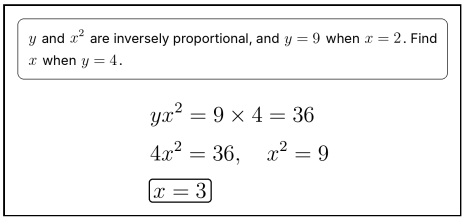
08



Say. So 4 x squared is 36, and x squared is 9.

Draw. Write 4x² = 36, x² = 9 on the next line.

09



Say. Take the square root: x is 3.

Draw. Write x = 3 and box it on the next line.

10

Trap $x^2 = 9$

$\times \quad x = 9$

$\checkmark \quad x = 3$

Say. Watch for the second trap: forgetting the root. 9 is x squared, not x.

Draw. Clear the board. Write “Trap” and $x^2 = 9$. Below, write x = 9 and cross it out ×. Then write x = 3 with a tick ✓.

11

Your turn

Square or cube first.

Finish with a root.

Say. Now it is your turn. Square or cube first, and finish with a root.

Draw. Point to today’s activity: Square or cube first. Finish with a root.