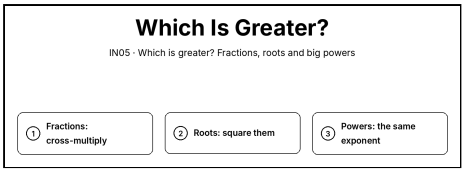
Which Is Greater?: teacher script

IN05-V1 · IN05 Which is greater? Fractions, roots and big powers · teachers only. Without a screen, read each Say line and draw each Draw step on the board. About 102 seconds as a video.

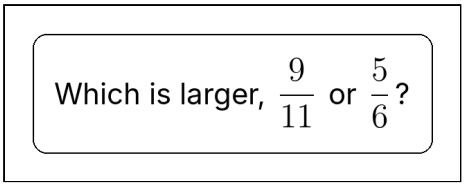
01



Say. Which is greater? For fractions, cross-multiply. For square roots, square them. For big powers, rewrite them with the same exponent.

Draw. Write the title “Which Is Greater?” and the steps: 1. Fractions: cross-multiply; 2. Roots: square them; 3. Powers: the same exponent.

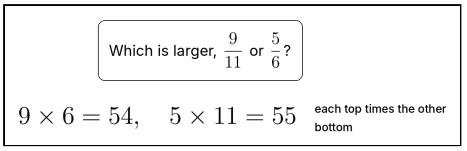
02



Say. Which is larger, 9 elevenths or 5 sixths?

Draw. Clear the board. Write “Which is larger, 9/11 or 5/6?” in a box at the top.

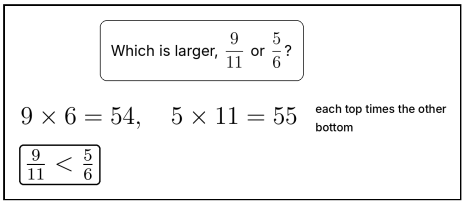
03



Say. Multiply each top by the other bottom: 9 times 6 is 54, and 5 times 11 is 55.

Draw. Write 9 × 6 = 54, 5 × 11 = 55 on the next line. Beside it, write “each top times the other bottom”.

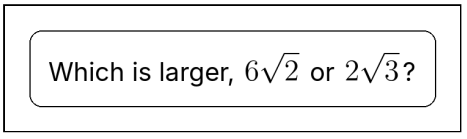
04



Say. 54 is less than 55, so 9 elevenths is less than 5 sixths.

Draw. Write 9/11 < 5/6 and box it on the next line.

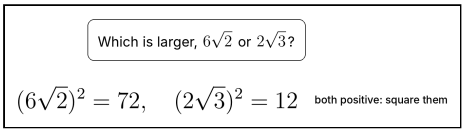
05



Say. Which is larger, 6 root 2, or 2 root 3?

Draw. Clear the board. Write “Which is larger, 6\sqrt2 or 2\sqrt3?” in a box at the top.

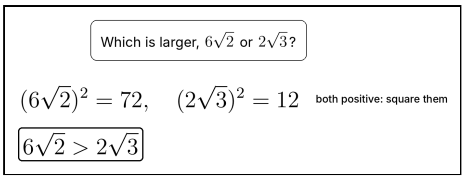
06



Say. Both are positive, so square them: 6 root 2 squared is 36 times 2, which is 72, and 2 root 3 squared is 4 times 3, which is 12.

Draw. Write (6\sqrt2)² = 72, (2\sqrt3)² = 12 on the next line. Beside it, write “both positive: square them”.

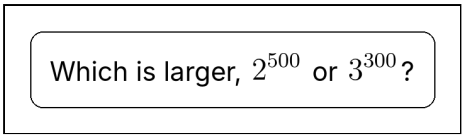
07



Say. 72 is more than 12, so 6 root 2 is larger.

Draw. Write 6\sqrt2 > 2\sqrt3 and box it on the next line.

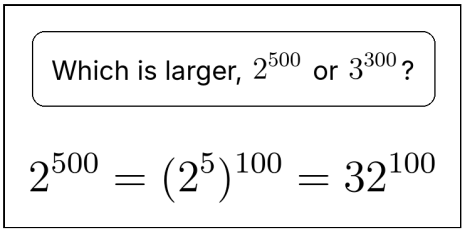
08



Say. Which is larger, 2 to the 500, or 3 to the 300?

Draw. Clear the board. Write “Which is larger, 2^{500} or 3^{300}?” in a box at the top.

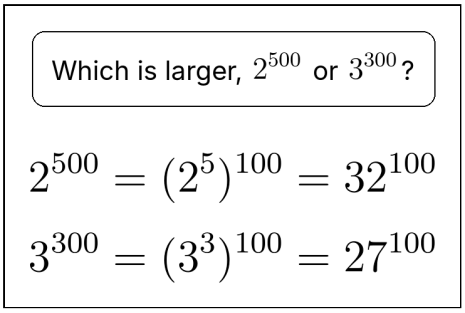
09



Say. 500 and 300 are both multiples of 100. 2 to the 500 is 2 to the 5, to the power 100: that is 32 to the 100.

Draw. Write $2^{500} = (2^5)^{100} = 32^{100}$ on the next line.

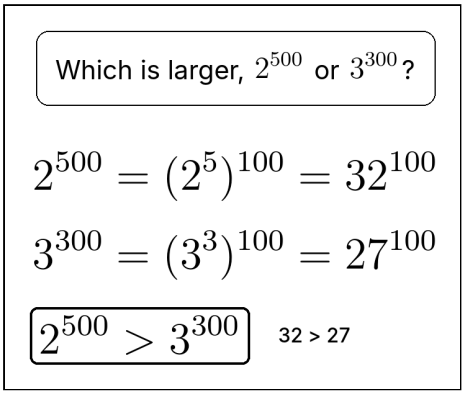
10



Say. And 3 to the 300 is 3 to the 3, to the power 100: 27 to the 100.

Draw. Write $3^{300} = (3^3)^{100} = 27^{100}$ on the next line.

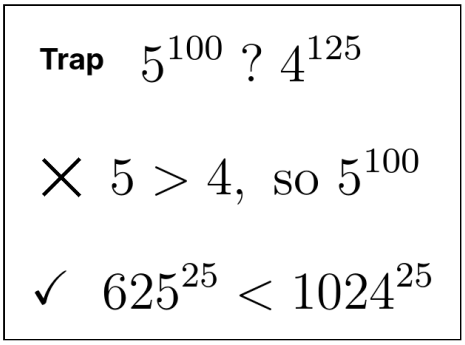
11



Say. 32 is bigger than 27, so 2 to the 500 is larger.

Draw. Write $2^{500} > 3^{300}$ and box it on the next line. Beside it, write “32 > 27”.

12



Say. Watch for the trap: don't compare the base alone. With the same exponent, 5 to the 100 is 625 to the 25, and 4 to the 125 is 1024 to the 25. So 4 to the 125 is larger.

Draw. Clear the board. Write “Trap” and 5^{100} ? 4^{125}. Below, write 5 > 4, so 5^{100} and cross it out ×. Then write $625^{25} < 1024^{25}$ with a tick ✓.

13

Your turn

Cross-multiply fractions; square roots.
Give big powers the same exponent.

Say. Now it is your turn. Cross-multiply fractions, square roots, and give big powers the same exponent.

Draw. Point to today’s activity: Cross-multiply fractions; square roots. Give big powers the same exponent.