One Denominator

EX14-V1 · storyboard · EX14 Common denominator: single-term denominators. Read each picture with its sentences.

Picture 1

Write $\frac{x}{2} + \frac{x}{3}$ as one fraction.

$$\frac{3x}{6} + \frac{2x}{6} \quad \text{LCD } 6$$

$$= \boxed{\frac{5x}{6}}$$

1. Write x over two, plus x over three, as one fraction.
2. Two and three both go into six.
3. x over two is three x over six, and x over three is two x over six.
4. Add the tops: five x over six.

Picture 2

Write $\frac{2}{3x} + \frac{3}{x}$ as one fraction.

$$\frac{2}{3x} + \frac{3 \cdot 3}{3 \cdot x}$$ LCD $3x$: top and bottom $\times 3$

$$= \frac{2}{3x} + \frac{9}{3x}$$

$$= \boxed{\frac{11}{3x}}$$ $2 + 9 = 11$

5. Now two over three x, plus three over x.
6. The lowest common denominator is three x, because it already contains x.
7. Rescale three over x: multiply the top and the bottom by three.
8. That is nine over three x.
9. Add the tops: eleven over three x.

Picture 3

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

$\times \dfrac{5}{4x}$

$\checkmark \dfrac{11}{3x}$

10. Watch for the trap: adding the bottoms.
11. Two over three x, plus three over x, is not five over four x.
12. Fractions add over one denominator: eleven over three x.

Picture 4

Trap $\dfrac{3}{x}$

$\times$ $\dfrac{3}{3x}$

✓ $\dfrac{9}{3x}$

13. And rescale the top too.
14. Three over x is not three over three x: the bottom was multiplied by three, so the top is too.