M8 - 10.7 - LCD "$\frac{x}{a}+\frac{b}{c}=\frac{d}{e}$" Notes

Solve for x by multiplying each term by the LCD

$x-1=\frac{1}{2}$

$LCD=2$

$2\times(x-1)=\frac{1}{2}\times 2$ — Multiply both sides by 2

$2x-2=1$ — Distribute

$+2\quad+2$ — Add 2 to both sides

$\frac{2x}{2}=\frac{3}{2}$ — Divide both sides by 2

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

Check Answer

$x-1=\frac{1}{2}$

$\frac{3}{2}-1=\frac{1}{2}$

$\frac{3}{2}-\frac{2}{2}=\frac{1}{2}$

$\frac{1}{2}=\frac{1}{2}$ ✓

Short Form

$x-1=\frac{1}{2}$

$2(x-1)=1$

$2x-2=1$

$2x=3$

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

OR

Algebra

$x-1=\frac{1}{2}$

$+1\quad+1$

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

Add Fractions

$\frac{1}{2}+1$

$\frac{1}{2}+\frac{2}{2}$

$\frac{3}{2}$

Expand $1=\frac{1}{1}=\frac{1\times 2}{1\times 2}=\frac{2}{2}$

$LCD=2$

Solve for x by multiplying each term by the LCD

$x-\frac{1}{4}=\frac{1}{2}$

$LCD=4$

$4\times\left(x-\frac{1}{4}\right)=\frac{1}{2}\times 4$ — Multiply both sides by 4

$4x-\frac{4}{4}=\frac{4}{2}$ — Distribute

$4x-1=2$

$+1\quad+1$ — Add 1 to both sides

$4x=3$

$\frac{4x}{4}=\frac{3}{4}$ — Divide both sides by 4

$x=\frac{3}{4}$

Check Answer

$x-\frac{1}{4}=\frac{1}{2}$

$\frac{3}{4}-\frac{1}{4}=\frac{1}{2}$

$\frac{2}{4}=\frac{1}{2}$

$\frac{1}{2}=\frac{1}{2}$ ✓

Short Form

$x-\frac{1}{4}=\frac{1}{2}$

$\left(x-\frac{1}{4}=\frac{1}{2}\right)\times 4$

$4x-1=2$

$4x=3$

$x=\frac{3}{4}$

Instead of actually multiplying by the LCD we are going to multiply and simplify at the same time.

Solve for x by multiplying each term by the LCD

$\frac{x}{2}+\frac{1}{4}=\frac{1}{3}$

$LCD=12$

$\left(\frac{x}{2}+\frac{1}{4}=\frac{1}{3}\right)\times 12$ — Multiply both sides by 12

$\frac{12x}{2}+\frac{12}{4}=\frac{12}{3}$ — Distribute

$6x+3=4$

$-3\quad-3$ — Simplify

$6x=1$

$x=\frac{1}{6}$ — Algebra

Check Answer

$\frac{x}{2}+\frac{1}{4}=\frac{1}{3}$

$\frac{\left(\frac{1}{6}\right)}{2}+\frac{1}{4}=\frac{1}{3}$

$\frac{1}{12}+\frac{1}{4}=\frac{1}{3}$

$\frac{1}{3}=\frac{1}{3}$ ✓

Fractions ÷ +

$\frac{\left(\frac{1}{6}\right)}{2}$

$\frac{1}{6}\div 2$

$\frac{1}{6}\times\frac{1}{2}$

$\frac{1}{12}$

$\frac{1}{12}+\frac{1}{4}$

$\frac{1}{12}+\frac{3}{12}$

$\frac{4}{12}$

$\frac{1}{3}$

Short Form

$\left(\frac{x}{2}+\frac{1}{4}=\frac{1}{3}\right)\times 12$

$6x+3=4$

$6x=1$

$x=\frac{1}{6}$