# LINEAR EQUATIONS INVOLVING FRACTIONS

Solve:

1 $\frac{2x}{3}+\frac{3x}{4}=34$ 2 $\frac{3x}{4}-\frac{2x}{5}=14$ 3 $\frac{3x}{5}=\frac{4x}{3}-22$

7 $\frac{2x-1}{8}=\frac{3x+1}{4}$ 8 $\frac{2x-1}{3}-5=\frac{x}{6}$ 9 $\frac{2(2a+1)}{3}=\frac{5(a-2)}{2}$

① $\frac{2x}{3}+\frac{3x}{4}=34$

$\Leftrightarrow \frac{8x+9x}{12}=34$

$\Leftrightarrow 17x=408$

$\Leftrightarrow x=\frac{408}{17}=24$

② $\frac{3x}{4}-\frac{2x}{5}=14$

$\Leftrightarrow \frac{15x-8x}{20}=14$

$\Leftrightarrow 7x=280$

$\Leftrightarrow \boxed{x=40}$

③ $\frac{3x}{5}=\frac{4x}{3}-22$

$\Leftrightarrow \frac{3x}{5}-\frac{4x}{3}=-22$

$\Leftrightarrow \frac{9x-20x}{15}=-22$

$\Leftrightarrow \frac{-11x}{15}=-22$

$\Leftrightarrow -11x=-330$

$\boxed{x=30}$

⑦ $\frac{2x-1}{8}=\frac{3x+1}{4}$

$\Leftrightarrow 2x-1=8\times\left(\frac{3x+1}{4}\right)$

$\Leftrightarrow 2x-1=2(3x+1)$

$\Leftrightarrow 2x-1=6x+2$

$\Leftrightarrow -4x=3$

$\Leftrightarrow \boxed{x=\frac{-3}{4}}$

⑧ $\frac{2x-1}{3}-5=\frac{x}{6}$

$\Leftrightarrow \frac{2x-1-15}{3}=\frac{x}{6}$

$\Leftrightarrow \frac{2x-16}{3}=\frac{x}{6}$

$\Leftrightarrow 2x-16=\frac{x}{2}$ $\Leftrightarrow 4x-32=x$

$\Leftrightarrow 3x=32$ $\Leftrightarrow \boxed{x=\frac{32}{3}}$

⑨ $\frac{2(2a+1)}{3}=\frac{5(a-2)}{2}$

$\Leftrightarrow 2\times 2(2a+1)=3\times 5(a-2)$

$\Leftrightarrow 4(2a+1)=15(a-2)$

$\Leftrightarrow 8a+4=15a-30$

$\Leftrightarrow -7a=-34$

$\Leftrightarrow \boxed{a=\frac{34}{7}}$

# LINEAR EQUATIONS INVOLVING FRACTIONS

**13** $\frac{3(x-2)}{5} = \frac{2(x-1)}{3} - \frac{2}{5}$ **14** $\frac{x-4}{x+2} = 5$ **15** $\frac{5}{x} + \frac{3}{2x} = 2$

(13) $\frac{3(x-2)}{5} = \frac{2(x-1)}{3} - \frac{2}{5}$

$\Leftrightarrow \frac{3x-6}{5} = \frac{2x-2}{3} - \frac{2}{5}$

$\Leftrightarrow \frac{3x-6}{5} = \frac{10x-10-6}{15}$

$\Leftrightarrow 3(3x-6) = 10x-16$

$\Leftrightarrow 9x-18 = 10x-16$

$\Leftrightarrow -x = -16+18$

$\Leftrightarrow x = -2$

(14) $\frac{x-4}{x+2} = 5$

$\Leftrightarrow x-4 = 5(x+2)$

$\Leftrightarrow x-4 = 5x+10$

$\Leftrightarrow -4x = 14$

$\Leftrightarrow x = -\frac{14}{4} = -\frac{7}{2}$

(15) $\frac{5}{x} + \frac{3}{2x} = 2 \Leftrightarrow \frac{10+3}{2x} = 2$

$\Leftrightarrow \frac{13}{2x} = 2$

$\Leftrightarrow 13 = 4x$

$\Leftrightarrow x = \frac{13}{4}$

## LINEAR EQUATIONS INVOLVING FRACTIONS

**19** $\frac{5}{a+3}=2$ **20** $\frac{y+3}{y+2}=\frac{y+1}{y+4}$ **21** $\frac{x-2}{x+3}=\frac{x+4}{x-5}$

(19) $\frac{5}{a+3}=2 \iff 5=2(a+3)$

$\iff 5=2a+6 \iff 2a=-1 \iff a=-1/2$

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(20) $\frac{y+3}{y+2}=\frac{y+1}{y+4} \iff (y+3)(y+4)=(y+1)(y+2)$

$\iff y^2+4y+3y+12=y^2+2y+y+2$

$\iff 7y+12=3y+2$

$\iff 4y=-10 \iff y=-\frac{10}{4}=-\frac{5}{2}$

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(21) $\frac{x-2}{x+3}=\frac{x+4}{x-5} \iff (x-2)(x-5)=(x+4)(x+3)$

$\iff x^2-5x-2x+10=x^2+3x+4x+12$

$\iff -7x+10=7x+12$

$\iff -14x=2$

$\iff x=-\frac{2}{14}=-\frac{1}{7}$

# LINEAR EQUATIONS INVOLVING FRACTIONS

**29** $\dfrac{1}{x+2}+\dfrac{1}{x-3}=\dfrac{1}{(x+2)(x-3)}$ **30** $\dfrac{1}{x+1}+\dfrac{1}{x+2}=\dfrac{1}{x^2+3x+2}$

(29) $\Leftrightarrow \dfrac{(x-3)+(x+2)}{(x+2)(x-3)} = \dfrac{1}{(x+2)(x-3)}$

$\Leftrightarrow 2x-1=1$

$\Leftrightarrow 2x=2$

$\Leftrightarrow \boxed{x=1}$

(30) $\dfrac{1}{x+1}+\dfrac{1}{x+2}=\dfrac{1}{x^2+3x+2}$

$\Leftrightarrow \dfrac{(x+2)+(x+1)}{(x+1)(x+2)} = \dfrac{1}{x^2+3x+2}$

$\Leftrightarrow \dfrac{2x+3}{x^2+3x+2} = \dfrac{1}{x^2+3x+2}$

$\Leftrightarrow 2x+3=1$

$\Leftrightarrow 2x=-2$

$\Leftrightarrow \boxed{x=-1}$