

Method 2 First simplify the numerator and denominator.

$$\begin{aligned} \frac{\frac{1}{x} + 3}{\frac{5}{y} + 4} &= \frac{\frac{1 + 3x}{x}}{\frac{5 + 4y}{y}} \\ &= \frac{1 + 3x}{x} \cdot \frac{y}{5 + 4y} \\ &= \frac{(1 + 3x)y}{x(5 + 4y)} \\ &= \frac{y + 3xy}{5x + 4xy} \end{aligned}$$

Write equivalent expressions with common denominators.

Add.

Divide the numerator fraction by the denominator fraction.

Multiply by the reciprocal.

 **CA Standards Check** 5 Simplify each complex fraction.

a. $\frac{1}{\frac{x}{y}}$

b. $\frac{3}{1 - \frac{1}{2y}}$

c. $\frac{\frac{x-2}{x} - \frac{2}{x+1}}{\frac{3}{x-1} - \frac{1}{x+1}}$



EXERCISES

For more exercises, see *Extra Skill and Word Problem Practice*.

Standards Practice

ALG2 7.0

A Practice by Example

The focal length f of a camera lens is 2 in. The lens equation is $\frac{1}{f} = \frac{1}{d_i} + \frac{1}{d_o}$, where d_i is the distance between the lens and the film and d_o is the distance between the lens and the object.



- The object to be photographed is 10 ft away. How far should the lens be from the film?
- The object to be photographed is 20 ft away. How far should the lens be from the film?
- Critical Thinking** Explain why one setting on the camera is used for photographing all objects that are more than 10 ft from the camera.

Example 2
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Find the least common multiple of each pair of polynomials.

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|---------------------------------------|--------------------------------------|
| 4. $9(x + 2)(2x - 1)$ and $3(x + 2)$ | 5. $x^2 - 1$ and $x^2 + 2x + 1$ |
| 6. $(x - 2)(x + 3)$ and $10(x + 3)^2$ | 7. $12x^2 - 6x - 126$ and $18x - 63$ |
| 8. $5y^2 - 80$ and $y + 4$ | 9. $x^2 - 32x - 10$ and $2x + 10$ |

Example 3
(page 523)

Simplify each sum.

- | | |
|--|---|
| 10. $\frac{1}{2x} + \frac{1}{2x}$ | 11. $\frac{d-3}{2d+1} + \frac{d-1}{2d+1}$ |
| 12. $\frac{5y+2}{xy^2} + \frac{2x-4}{4xy}$ | 13. $\frac{5x}{x^2-9} + \frac{2}{x+4}$ |
| 14. $\frac{-3x}{x^2-9} + \frac{4}{2x-6}$ | 15. $\frac{5x}{x^2-x-6} + \frac{4}{x^2+4x+4}$ |