

# SUBTRACTING MIXED NUMBERS WITH UNLIKE DENOMINATORS WITHOUT BORROWING

# ANSWERS

Subtract the mixed numbers. Make sure the final answer is in simplest form.

### HELPFUL EXAMPLE #1

$$6 \frac{5}{6} - 4 \frac{3}{8}$$

ON THESE PROBLEMS, WE WILL PRACTICE FINDING A COMMON MULTIPLE OR DENOMINATOR BUT WILL NOT HAVE TO BORROW.

$$\frac{5}{6} - \frac{3}{8}$$

FIRST, SUBTRACT THE FRACTIONS. THEY DO NOT HAVE COMMON DENOMINATORS SO WE WILL NEED TO FIND THE LEAST COMMON DENOMINATOR (LCD) OR LEAST COMMON MULTIPLE (LCM).

$$\frac{5}{6} - \frac{3}{8} \rightarrow \text{MULTIPLES OF 6 AND 8} \left\{ \begin{array}{l} 6 \rightarrow 6, 12, 18, \mathbf{24}, 30 \\ 8 \rightarrow 8, 16, \mathbf{24}, 32 \end{array} \right\}$$

THEY HAVE 24 IN COMMON, SO CHANGE THEIR DENOMINATORS (BOTTOM) TO 24.

$$\begin{array}{l} \frac{5}{6} \times \frac{4}{4} = \frac{20}{24} \\ \frac{3}{8} \times \frac{3}{3} = \frac{9}{24} \end{array} \left. \vphantom{\begin{array}{l} \frac{5}{6} \\ \frac{3}{8} \end{array}} \right\} \frac{20}{24} - \frac{9}{24} = \frac{11}{24}$$

20 IS BIGGER THAN 9 WHICH MEANS WE CAN SUBTRACT.

REMEMBER, FRACTIONS MUST HAVE THE SAME DENOMINATORS BEFORE THEY CAN BE SUBTRACTED. ALSO, IF THE FIRST FRACTION IS TOO SMALL YOU WILL HAVE TO BORROW FROM THE WHOLE NUMBER. BORROWING IS COVERED IN EXAMPLE #2.

WHATEVER WE DO TO THE BOTTOM WE NEED TO DO TO THE TOP!!!

$$6 - 4 = \mathbf{2}$$

SECOND, QUICKLY SUBTRACT THE WHOLE NUMBERS.

$$2 \text{ and } \frac{11}{24} = 2 \frac{11}{24}$$

LAST, PUT THE TWO ANSWERS TOGETHER. MAKE SURE IT IS IN SIMPLEST FORM.

Now your turn.

1.  $7 \frac{3}{4} - 2 \frac{1}{6}$   
 $\mathbf{5 \frac{7}{12}}$

2.  $8 \frac{1}{2} - 4 \frac{3}{7}$   
 $\mathbf{4 \frac{1}{14}}$

3.  $6 \frac{7}{10} - 6 \frac{3}{8}$   
 $\mathbf{\frac{13}{40}}$

4.  $4 \frac{5}{9} - \frac{5}{12}$   
 $\mathbf{4 \frac{5}{36}}$

5.  $9 \frac{7}{8} - 1 \frac{1}{4}$   
 $\mathbf{8 \frac{5}{8}}$

6.  $3 \frac{5}{17} - 2$   
 $\mathbf{1 \frac{5}{17}}$

7.  $6 \frac{2}{3} - 3 \frac{4}{15}$   
 $\mathbf{3 \frac{2}{5}}$

8.  $2 \frac{7}{12} - \frac{5}{9}$   
 $\mathbf{2 \frac{1}{36}}$

9.  $5 \frac{3}{5} - 4 \frac{2}{11}$   
 $\mathbf{1 \frac{23}{55}}$

Circle the greatest (largest) fraction in each group.

10.  $\frac{4}{5}$  or  $\frac{2}{3}$

11.  $\frac{5}{7}$  or  $\frac{5}{8}$

12.  $\frac{2}{9}$  or  $\frac{3}{14}$

13.  $\frac{6}{13}$  or  $\frac{9}{17}$

# SUBTRACTING MIXED NUMBERS WITH UNLIKE DENOMINATORS WITH BORROWING

# ANSWERS

Subtract the mixed numbers. Make sure the final answer is in simplest form.

## HELPFUL EXAMPLE #2

$$7 \frac{1}{5} - 3 \frac{1}{3}$$

ON THESE PROBLEMS, WE WILL PRACTICE FINDING A COMMON MULTIPLE OR DENOMINATOR AND LEARN HOW TO BORROW.

$$\frac{1}{5} - \frac{1}{3}$$

FIRST, SUBTRACT THE FRACTIONS. THESE FRACTIONS ALSO DO NOT HAVE COMMON DENOMINATORS SO WE WILL NEED TO FIND THE LEAST COMMON DENOMINATOR.

$$\frac{1}{5} - \frac{1}{3} \longrightarrow \text{MULTIPLES OF 5 AND 3} \left\{ \begin{array}{l} 5 \rightarrow 5, 10, \mathbf{15}, 20 \\ 3 \rightarrow 3, 6, 9, 12, \mathbf{15}, 18 \end{array} \right\}$$

THEY HAVE 15 IN COMMON, SO CHANGE THEIR DENOMINATORS (BOTTOM) TO 15.

$$\frac{1}{5} \times \frac{3}{3} = \frac{3}{15} \quad \text{and} \quad \frac{1}{3} \times \frac{5}{5} = \frac{5}{15} \longrightarrow \frac{3}{15} - \frac{5}{15} = \text{JUST CAN'T DO IT}$$

REMEMBER, WHATEVER WE DO TO THE BOTTOM WE NEED TO DO TO THE TOP!!!

3 IS TOO SMALL SO WE NEED TO **BORROW**.

BEFORE WE START TO BORROW LETS TAKE A LOOK AT OUR NEW EQUIVALENT FRACTIONS.  $\longrightarrow 7 \frac{1}{5} = 7 \frac{3}{15}$  and  $3 \frac{1}{3} = 3 \frac{5}{15}$

THE FRACTIONS HAVE COMMON DENOMINATORS AND THE PROBLEM LOOKS LIKE THIS.  $\longrightarrow 7 \frac{3}{15} - 3 \frac{5}{15}$

THIS IS WHAT NEEDS TO BE DONE.

$$7 \frac{3}{15} = 6 + \boxed{1} + \frac{3}{15} = 6 + \frac{15}{15} + \frac{3}{15} = 6 \frac{18}{15}$$

WE NEED TO TAKE **ONE** AWAY FROM SEVEN AND GIVE IT TO THE FRACTION, BUT WE NEED TO TURN THAT **ONE** INTO A FRACTION TOO.

$$\boxed{7 \frac{3}{15}} \text{ IS THE SAME AS } \boxed{6 \frac{18}{15}}$$

$$6 \frac{18}{15} - 3 \frac{5}{15}$$

NOW THE PROBLEM LOOKS LIKE THIS AND WE CAN FOLLOW THE BASIC STEPS TO SUBTRACT THESE TWO MIXED NUMBERS.

$$\frac{18}{15} - \frac{5}{15} = \frac{13}{15}$$

FIRST, SUBTRACT THE FRACTIONS.

$$6 - 3 = \boxed{3}$$

SECOND, SUBTRACT THE WHOLE NUMBERS.

$$3 \text{ and } \frac{13}{15} = 3 \frac{13}{15}$$

LAST, PUT THE TWO ANSWERS TOGETHER. IS IT IN SIMPLEST FORM?

Now your turn.

1.  $6 \frac{4}{11} - 1 \frac{1}{2}$   
 $4 \frac{19}{22}$

2.  $9 \frac{1}{4} - 3 \frac{3}{8}$   
 $5 \frac{7}{8}$

3.  $3 \frac{5}{6} - 2 \frac{7}{10}$   
 $1 \frac{2}{15}$

4.  $7 \frac{2}{5} - 2 \frac{2}{3}$   
 $4 \frac{11}{15}$

5.  $4 \frac{5}{6} - \frac{11}{15}$   
 $4 \frac{1}{10}$

6.  $8 \frac{2}{3} - 4 \frac{3}{4}$   
 $3 \frac{11}{12}$