

**PreAlgebra**  
**Skill-BUILDER #SMN-4**  
**Dividing Signed Mixed Numbers**

Recall that when dividing two numbers with same signs, the quotient will be positive. If the two numbers have different signs, the quotient will be negative.

This rule also applies when we divide signed mixed numbers. After taking care of the signs, you should convert the mixed numbers to improper fractions, and then divide them as fractions.

Recall that:  $\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c}$

Remember to always reduce your final answer to lowest terms. Usually, it is stated that you have to give your answer as a mixed number if possible.

**Example 1**

Divide and simplify:  $\left(-15\frac{2}{5}\right) \div \left(-3\frac{2}{11}\right)$

$$\begin{aligned} \left(-15\frac{2}{5}\right) \div \left(-3\frac{2}{11}\right) &= + \left(\frac{15 \cdot 5 + 2}{5} \div \frac{3 \cdot 11 + 2}{11}\right) = + \left(\frac{77}{5} \div \frac{35}{11}\right) \\ &\text{Both mixed numbers are negative (same sign!)} \\ &\text{so the quotient will be positive.} \\ &= + \left(\frac{\overset{11}{\cancel{77}}}{5} \cdot \frac{11}{\underset{5}{\cancel{35}}}\right) \\ &= + \frac{121}{25} = 4\frac{21}{25} \\ &\text{convert to mixed numbers} \end{aligned}$$

Answer:  $4\frac{21}{25}$

**Example 2**

Divide and simplify:  $\left(10\frac{2}{5}\right) \div \left(-8\frac{3}{4}\right)$

$$\begin{aligned} \left(10\frac{2}{5}\right) \div \left(-8\frac{3}{4}\right) &= - \left(\frac{10 \cdot 5 + 2}{5} \div \frac{8 \cdot 4 + 3}{4}\right) = - \left(\frac{52}{5} \div \frac{35}{4}\right) = - \left(\frac{52}{5} \cdot \frac{4}{35}\right) \\ &\text{One mixed number is positive and the other is negative (different sign!)} \\ &\text{so the quotient will be negative.} \\ &= - \frac{208}{175} \\ &= -1\frac{33}{175} \end{aligned}$$

Answer:  $-1\frac{33}{175}$

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Divide the following.

1.  $\left(-5\frac{1}{4}\right) \div \left(-3\frac{1}{2}\right)$

2.  $\left(-4\frac{1}{2}\right) \div \left(5\frac{1}{10}\right)$

3.  $\left(10\frac{2}{5}\right) \div \left(3\frac{1}{13}\right)$

4.  $\left(7\frac{2}{7}\right) \div \left(-5\frac{2}{3}\right)$

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**Answers**

1.  $1\frac{1}{2}$

2.  $-\frac{15}{17}$

3.  $3\frac{19}{50}$

4.  $-1\frac{2}{7}$