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: $\dfrac{a}{b} \div \dfrac{c}{d} = \dfrac{a}{b} \cdot \dfrac{d}{c}$

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: $\left(-15\dfrac{2}{5}\right) \div \left(-3\dfrac{2}{11}\right)$

$$\left(-15\dfrac{2}{5}\right) \div \left(-3\dfrac{2}{11}\right) = +\left(\dfrac{15\cdot5+2}{5} \div \dfrac{3\cdot11+2}{11}\right) = +\left(\dfrac{77}{5} \div \dfrac{35}{11}\right)$$

Both mixed numbers are negative **(same sign!)**

so the quotient will be **positive**.

$$= +\left(\dfrac{\overset{11}{\cancel{77}}}{5} \cdot \dfrac{11}{\underset{5}{\cancel{35}}}\right)$$

$$= +\dfrac{121}{25} = 4\dfrac{21}{25}$$

convert to mixed numbers

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

Example 2

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

$$\left(10\dfrac{2}{5}\right)\div\left(-8\dfrac{3}{4}\right) = -\left(\dfrac{10\cdot5+2}{5} \div \dfrac{8\cdot4+3}{4}\right) = -\left(\dfrac{52}{5} \div \dfrac{35}{4}\right) = -\left(\dfrac{52}{5} \cdot \dfrac{4}{35}\right)$$

One mixed number is positive and the other is negative **(different sign!)**

so the quotient will be **negative**.

$$= -\dfrac{208}{175}$$

$$= -1\dfrac{33}{175}$$

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

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Divide the following.

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

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

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

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

Answers

1. $1\dfrac{1}{2}$

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

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

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