PreAlgebra
Skill-Builder #SMN–6

Performing Combined Operations on Signed Mixed Numbers

Follow the order of operations **PEMDAS**:

Parentheses (includes any grouping symbols like parentheses ( ), brackets [ ], absolute values | |, etc)
When there is more than one set of grouping symbols, simplify from innermost and work outwards.

Exponents

Multiplication/**D**ivision (simplify from left to right, whichever comes first)

Addition/**S**ubtraction (simplify from left to right, whichever comes first)

Example 1

Simplify: $1\frac{4}{5} + \left(3\frac{4}{15}\right) \cdot \left(2\frac{1}{7}\right)$

To multiply, convert mixed numbers to improper fractions

$= 1\frac{4}{5} + \left(\frac{3\cdot 15+4}{15}\right) \cdot \left(\frac{2\cdot 7+1}{7}\right) = 1\frac{4}{5} + \left(\frac{\cancel{49}^{7}}{\cancel{15}_{1}}\right) \cdot \left(\frac{\cancel{15}^{1}}{\cancel{7}_{1}}\right) = 1\frac{4}{5} + 7 = \boxed{8\frac{4}{5}}$ *Answer*

Example 2

Simplify: $1\frac{4}{5} \div \left(3\frac{4}{15}\right) \cdot \left(-2\frac{1}{3}\right)^2$

$= 1\frac{4}{5} \div \left(3\frac{4}{15}\right) \cdot \left(-\frac{7}{3}\right)^2$ Do exponents first! (Convert to improper fractions)

$= 1\frac{4}{5} \div \left(3\frac{4}{15}\right) \cdot \left(\frac{49}{9}\right)$ Recall: $(negative\ number)^{even\ exponent} = positive\ result$

$= \frac{9}{5} \div \left(\frac{49}{15}\right) \cdot \left(\frac{49}{9}\right)$ Do division next. (Convert to improper fractions)

$= \frac{\cancel{9}^{1}}{\cancel{5}_{1}} \cdot \left(\frac{\cancel{15}^{3}}{\cancel{49}_{1}}\right) \cdot \left(\frac{\cancel{49}^{1}}{\cancel{9}_{1}}\right)$ Convert division to ***multiplication by reciprocal of divisor***

$= \boxed{3}$ *Answer*

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Simplify the following.

1. $\left(1\frac{1}{2}\right)^2 - \left(1\frac{1}{4}\right)^2$

2. $12\frac{2}{5} - \left(3\frac{1}{2}\right) \cdot \left(2\frac{2}{7}\right)$

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

4. $\left(-1\frac{2}{3}\right)^2 - \left(1\frac{1}{4}\right) \cdot (2)$

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Answers

1. $\frac{11}{16}$

2. $4\frac{2}{5}$

3. 6

4. $\frac{5}{18}$

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