PreAlgebra
Skill-Builder #SMN–6
Performing Combined Operations on Signed Mixed Numbers

Follow the order of operations $\mathbf{PEMDAS}$:

$\mathbf{P}$arentheses (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.

$\mathbf{E}$xponents

$\mathbf{M}$ultiplication/$\mathbf{D}$ivision (simplify from left to right, whichever comes first)

$\mathbf{A}$ddition/$\mathbf{S}$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

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

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

$= \boxed{3}$ *Answer*

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Simplify the following.

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

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

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

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

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Answers

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

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

3.   6

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

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