Pre-algebra
Skill-Builder # F – 7
Combined Operations on Signed Fractions

Follow the order of operations

> **P**arentheses
> **E**xponentiation
> **M**ultiplication/**D**ivision
> **A**ddition/**S**ubtraction

Note:
    a. Multiplication and division as well as addition and subtraction are performed in the order in which they appear from left to right.
    b. When there is more than one set of parentheses or symbols of grouping, perform the operation(s) inside the innermost parentheses or symbols of grouping first.

<u>Examples</u> Perform the indicated operations.

1) $\dfrac{1}{2} \cdot \dfrac{4}{3} - \dfrac{7}{5} \div \dfrac{14}{25}$

Solution:

$$\dfrac{1}{2} \cdot \dfrac{4}{3} - \dfrac{7}{5} \div \dfrac{14}{25}$$

$$= \dfrac{1}{2} \cdot \dfrac{4}{3} - \dfrac{7}{5} \cdot \dfrac{25}{14}$$

$$= \dfrac{1}{\cancel{2}} \cdot \dfrac{\cancel{2} \cdot 2}{3} - \dfrac{\cancel{7}}{\cancel{5}} \cdot \dfrac{\cancel{5} \cdot 5}{2 \cdot \cancel{7}}$$

$$= \dfrac{2}{3} - \dfrac{5}{2}$$

$$= \dfrac{2 \cdot \mathbf{2} - 5 \cdot \mathbf{3}}{6}$$

$$= \dfrac{4 - 15}{6}$$

$$= -\dfrac{11}{6}$$

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

Solution:

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

$$= -\dfrac{3}{2}\left(-\dfrac{2}{3}\right)\left(-\dfrac{2}{3}\right)\left(-\dfrac{2}{3}\right) \div \left(-\dfrac{2}{3}\right) \cdot \left(-\dfrac{3}{4}\right)$$

$$= \dfrac{4}{9} \div \left(-\dfrac{2}{3}\right) \cdot \left(-\dfrac{3}{4}\right)$$

$$= \dfrac{4}{9} \cdot \left(-\dfrac{3}{2}\right) \cdot \left(-\dfrac{3}{4}\right)$$

$$= \dfrac{4}{9} \cdot \dfrac{3}{2} \cdot \dfrac{3}{4}$$

$$= \dfrac{\cancel{4}}{\cancel{3} \cdot \cancel{3}} \cdot \dfrac{\cancel{3}}{2} \cdot \dfrac{\cancel{3}}{\cancel{4}}$$

$$= \dfrac{1}{2}$$

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Perform the indicated operations.

1) $-\dfrac{1}{2} - \dfrac{3}{4} \div \dfrac{5}{2}$

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

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

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

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Answer Key:

1) $-\dfrac{4}{5}$

2) $\dfrac{11}{72}$

3) $\dfrac{9}{2}$

4) $\dfrac{5}{21}$

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