Name: _____   Date: _____

Learning Goal 2.3	I can apply order of operations to fractions.

Find the value of the following expression.

$$2 \div \frac{1}{4} + 3 \times \frac{1}{2}$$

Brackets

Exponents

Division

Multiplication

Addition

Subtraction

$$= 2 \times \frac{4}{1} + 3 \times \frac{1}{2}$$

$$= 8 + \frac{3}{1} \times \frac{1}{2}$$

$$= \frac{8}{1} + \frac{3}{2}$$

Mixed

$$= 8 + 1\frac{1}{2}$$

$$= 9\frac{1}{2}$$

Improper

$$= \frac{16}{2} + \frac{3}{2}$$

$$= \frac{19}{2}$$

Example Find the value of the expression. Show all work and leave answer in lowest terms.

a. $\left(\frac{1}{3}\right)^2 \times (13 - 2) - \frac{5}{6}$

$$= \left(\frac{1}{3}\right)^2 \times 11 - \frac{5}{6}$$

$$= \frac{1}{9} \times \frac{11}{1} - \frac{5}{6}$$

$$= \frac{11 \times 2}{9 \times 2} - \frac{5 \times 3}{6 \times 3} \qquad LCM(6,9) = 18$$

$$= \frac{22}{18} - \frac{15}{18}$$

$$= \frac{7}{18}$$

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

$$= \frac{9}{4} \div \left(\frac{7}{4} + \frac{5}{4}\right)$$

$$= \frac{9}{4} \div \frac{12}{4} \Rightarrow = \frac{9}{4} \div 3$$

$$= \frac{9}{4} \times \frac{4}{12} \qquad = \frac{9^3}{4} \div \frac{3}{4}$$

$$= \frac{9^3}{1} \times \frac{1}{12_4} \qquad = \frac{3}{4}$$

$$= \frac{3}{1} \times \frac{1}{4}$$

$$= \frac{3}{4}$$

B
E
D
M
A
S

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c. $\left(-\dfrac{7}{10}\right) \div \left(-\dfrac{2}{5}\right) - \left(-\dfrac{1}{4}\right) \times \dfrac{1}{2} = \dfrac{15}{8}$ d. $\left(-\dfrac{5}{4}\right) \div \left(-\dfrac{1}{4} + \dfrac{3}{2}\right)^2 = -\dfrac{4}{5}$

$= \left(-\dfrac{7}{\overset{2}{\cancel{10}}}\right) \times \left(-\dfrac{\overset{-1}{\cancel{5}}}{2}\right) - \left(-\dfrac{1}{4}\right) \times \dfrac{1}{2}$

$= \left(-\dfrac{7}{2}\right) \times \left(-\dfrac{1}{2}\right) - \left(-\dfrac{1}{4}\right) \times \dfrac{1}{2}$

$= \dfrac{7}{4} - \left(-\dfrac{1}{4}\right) \times \dfrac{1}{2}$

$= \dfrac{7 \times 2}{4 \times 2} - \left(-\dfrac{1}{8}\right)$ LCM $(4, 8) = 8$

$= \dfrac{14}{8} - \left(-\dfrac{1}{8}\right)$

$= \dfrac{15}{8}$

Example Ellie earns $25 per hour as a machine operator in a sawmill. For time worked over 40 hours in a week, she earns time-and-a-half. How much does Ellie earn for working 46 hours in a week?

$40 \times 25 + 6\left(1\tfrac{1}{2} \times 25\right)$

$= 40 \times 25 + 6\left(\dfrac{3}{2} \times \dfrac{25}{1}\right)$

$= 40 \times 25 + 6\left(\dfrac{75}{2}\right)$

$= 1000 + \dfrac{\overset{3}{\cancel{6}}}{1}\left(\dfrac{75}{\cancel{2}_1}\right)$

$= 1000 + 225 = 1225$

Ellie gets $1225 for working 46 hours in one week.

Example Ron earns $15 per hour as a security guard. For time worked above 35 hours in a week, he earns time-and-a-third. How much does Ron earn for working 41 hours in a week?

$35 \times 15 + (41 - 35)\left(1\tfrac{1}{3} \times 15\right)$

$= 35 \times 15 + 6\left(\dfrac{4}{\cancel{13}} \times \dfrac{\cancel{15}^{5}}{1}\right)$

$= 35 \times 15 + 6\left(\dfrac{4}{1} \times \dfrac{5}{1}\right)$

$= 35 \times 15 + 6(20)$

$= 525 + 6(20)$

$= 525 + 120$

$= 645$

$\dfrac{450}{75}$

Ron makes $645 for working 41 hours in a week.

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