3.4 Division with Fractions

1. Rule for Dividing Fractions: If a,b,c and d are integers and neither b,c nor d is zero, then

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \bullet \frac{d}{c} = \frac{ad}{bc}$$

To divide two fractions, multiply the first fraction by the reciprocal of the second.

Example: Divide the given fractions.

a. $\frac{5}{9} \div 10$

b. $(-27) \div \left(\frac{3}{2}\right)$

c. $-\frac{x}{y^2} \div \frac{x}{y}$

d. $(-15) \div \left(-\frac{4}{3}\right)$

e. $\frac{18}{25} \div \left(-\frac{6}{35}\right)$

2. Simplifying Fractional Expressions That Contain Multiplication, Division and Exponents: Use the order of operations agreement and the rules for adding, subtracting, multiplying and dividing fractions to simplify.

Note: Portions of this document are excerpted from the textbook *Prealgebra,* 7th ed. by Charles McKeague

Example: Simplify each of the following.

a. $\frac{5}{32} \div \frac{15}{16} \bullet \frac{2}{3}$

b. $\frac{10a^2}{3b} \div \frac{5a}{6b} \bullet \frac{1}{2}$

c. $-\frac{28}{125} \div \left(\frac{5x}{2}\right) \bullet \frac{1}{x}$

d. $\frac{4}{5} \bullet \frac{5}{3} \div \left(-\frac{8}{9}\right)$

e. $24 \div \left(\frac{2}{5}\right)^2 + 25 \div \left(\frac{5}{6}\right)^2$

f. $9 \div \left(\frac{3}{5}\right)^2 + 25 \div \left(\frac{5}{7}\right)^2$

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