

Name: _____

Date: _____

Learning Goal 3.3

I can multiply and divide rational numbers.

Recall Dividing integers:

a. $8 \div 7$

$= \frac{8}{7}$

fractions are superior!

$$\begin{array}{r}
 1.142 \dots \\
 7 \overline{) 8.000} \\
 \underline{-7} \\
 10 \\
 \underline{-7} \\
 30 \\
 \underline{-28} \\
 20 \\
 \underline{14} \\
 6
 \end{array}$$

b. $(-8) \div 7$

$= -\frac{8}{7}$

so fast!

c. $7 \div (-8)$

$= -\frac{7}{8}$

** order matters **

d. $(-11) \div (-9)$

$= -\frac{11}{-9}$

$= \frac{11}{9}$

e. $(-14) \div 5$

$= -\frac{14}{5}$

f. $2 \div (-12)$

$= \frac{2}{-12}$

$= -\frac{1}{6}$

Recall Dividing decimals:

a. $8.6 \div 6.3 = 86 \div 63$

$$\begin{array}{r}
 1.36 \dots \\
 63 \overline{) 86.000} \\
 \underline{-63} \\
 230 \\
 \underline{-189} \\
 410 \\
 \underline{-378} \\
 320
 \end{array}$$

b. $(-6.3) \div 8.6$

$= 63 \div 86$

≈ 0.73

c. $(-3.2) \times (-7.4)$

$= -32 \div -74$

$= \frac{32}{74}$

$= \frac{16}{37}$

≈ 0.43

Finally Dividing Fractions:

1. Proper and Improper Fractions.

$$\begin{aligned} \text{a.} \quad & \frac{2}{5} \div \frac{3}{7} \\ & = \frac{2}{5} \times \frac{7}{3} \\ & = \frac{2 \times 7}{5 \times 3} \\ & = \frac{14}{15} \end{aligned}$$

$$\begin{aligned} \text{b.} \quad & \left(-\frac{2}{7}\right) \div \frac{5}{2} \\ & = -\frac{2}{7} \times \frac{2}{5} \\ & = \frac{-2 \times 2}{7 \times 5} \\ & = -\frac{4}{35} \end{aligned}$$

$$\begin{aligned} \text{c.} \quad & \frac{3}{7} \div \left(-\frac{4}{7}\right) \\ & = \frac{3}{7} \times -\frac{7}{4} \\ & = \frac{3 \times -7}{7 \times 4} \\ & = -\frac{3}{4} \end{aligned}$$

$$\begin{aligned} \text{d.} \quad & \left(-\frac{5}{6}\right) \div \left(-\frac{11}{3}\right) \\ & = -\frac{5}{6} \times -\frac{3}{11} \\ & = \frac{-5 \times -3}{6 \times 11} \\ & = \frac{5}{22} \end{aligned}$$

$$\begin{aligned} \text{e.} \quad & \left(-\frac{1}{4}\right) \div \frac{3}{2} \\ & = -\frac{1}{4} \times \frac{2}{3} \\ & = \frac{-1 \times 2}{4 \times 3} \\ & = -\frac{1}{6} \end{aligned}$$

$$\begin{aligned} \text{f.} \quad & \left(-\frac{1}{3}\right) \div \frac{4}{1} \\ & = -\frac{1}{3} \times \frac{1}{4} \\ & = \frac{-1 \times 1}{3 \times 4} \\ & = -\frac{1}{12} \end{aligned}$$

2. Mixed Fractions.

$$\begin{aligned} \text{a.} \quad & 3\frac{2}{5} \div 1\frac{1}{2} \\ & = \frac{17}{5} \div \frac{3}{2} \\ & = \frac{17}{5} \times \frac{2}{3} \\ & = \frac{17 \times 2}{5 \times 3} \\ & = \frac{34}{15} \end{aligned}$$

$$\begin{aligned} \text{b.} \quad & \left(-1\frac{2}{5}\right) \div 1\frac{1}{3} \\ & = -\frac{12}{5} \div \frac{4}{3} \\ & = -\frac{12}{5} \times \frac{3}{4} \\ & = \frac{-12 \times 3}{5 \times 4} \\ & = -\frac{9}{5} \end{aligned}$$

$$\begin{aligned} \text{c.} \quad & 4\frac{2}{5} \div \left(-2\frac{3}{4}\right) \\ & = \frac{22}{5} \div -\frac{11}{4} \\ & = \frac{22}{5} \times -\frac{4}{11} \\ & = \frac{22 \times -4}{5 \times 11} \\ & = -\frac{8}{5} \end{aligned}$$